OZAmiga

Magazine

AMOS Professional
CanDo in depth
Virtual Reality and the Amiga
AMOS competition
And much More

Virus Checker 6.2
SnoopDos 1.7
The Instructor
BootBlock Slide show
Maker and more!!

OZAmiga Magazine

CONTENTS

THE CREW

Disclaimer

Subscribe and Save

EDITORIAL

Hello and welcome to Edition Five. I hope everone had a good Christmas and a safe New Year (I know I did). My first statement is an apology for that disgusting photo of myself which appeared in Edition Four (I can assure you THAT will not happen again).

Now down to business, in this edition you will find our regular assembly programming tutorial continued by Chris Leathley as well as the ongoing AMOS column by Neil McKnight. Neil also has a good look at AMOS professional and what it can do.

On page seven you will find details of an AMOS competition in which you could win a copy of AMOS Pro for your very own. The winner of this competition will have their program distributed on the Coverdisk of Edition Eight.

Mr Leathley begins a column in this edition especially for those assembly programmers a bit more advanced than his regular tutorial allows for.

I have had David Jacobs of Creations do a much more in depth article on Can Do version 2 as I lacked time to go into much detail for Edition Four. John Pospisil has given us a look into what the future holds for the Amiga and Virtual Reality. Ian Harris again puts pen to parchment and with his usual off beat sense of humour sends us belly up with the Dear Denise letters.

I recieved a letter from a gentleman in NSW named Matt who didnt want his letter published. Whilst I must conform to his wishes in this matter, he raised some very interesting points that I would like to mention to all readers. First of all, his letter was a list of things he would like to see in the OZAmiga. I would very much like to get a lot more feedback along these lines as it is you who reads the magazine and you who can suggest which direction we take with it.

Matt sees the CDTV section as a waste of space and not relavent to him at all. The list of titles included in Edition Four was a one off and will not be repeated unless there is a specific request.

He also recommended that the User Group page be a dedicated section. You will find that there is no User Group

information in this edition. This is because it is very hard to get anything from the groups (dont ask me why??????).

Some of the other subject that Matt brought up, like Amigas at Work, C-programming and Classifieds are dealt with in an article on the inside back cover entitled The Future and OZAmiga.

Last but not least, I would like to clarify a point raised by one of the readers. It was asked why we don't put a rating on our games reviews. The simple answer to this is that we feel everyone has different likes and dislikes, so a game that is rated high by us may be regarded as total rubish by someone else and this goes vice versa as well. The solution for us was to not put a rating on it but to reveal the nature of the game and let you find out for yourself if it is to your liking.

Thats enough from me, I will let you get on to the heart of the mag.
By till next time.

Dave Reeves
EDITOR

Letters To the Editor

Dear David,

What a pleasent surprise to suddenly find another Australian magazine devoted to the mighty Amiga on my local newsagents rack !

And a coverdisk too !!

My only disappointment is that I had not seen it earlier in the year and so by now would have had all copies starting from the first edition.
As treasurer of the local Amiga Users Group (WAG.,Wollongong Amiga Group). I will certainly mention your magazine at the next monthly meeting.

Kind regards,
Bill Hall
Mount Ousley NSW

Dear Bill,

Thanks for your letter. We can certainly supply you with back issues at this stage, although stocks are limited. Whilst you are mentioning the magazine to your User Group, also mention the fact that we will gladly publish any information about the group and upcoming activities in an effort to help more people into groups.
Please send your User Group information to:

OZAmiga User Groups
PO Box 567
Mirrabooka
WA 6061

Regards,
Dave

Dear David,

Your magazine has only recently appeared in the ACT and is a refreshing change from some of the other overseas and local magazines.

What I like about OZAmiga is that the articles are direct and informative, you don't waste precious (to the buyer) space with facetious comments which insult the readers intellegence.

The only minus point (which I can live with for now) is the spelling/typos. I guess this will improve as time goes on. Anyway, good luck with your magazine, I shall look forward to the next issue.

Sincerely,
Frank Campbell
Waramanga ACT

Dear Frank,

Edition Four was only the second to go through a national distributor, this could explain your delay in seeing a copy.

I am glad you like the writing style of our contributors, as most of them are just regular Amiga users themselves.

With regard to the typos, you are correct in assuming that time will heal all, I am relatively new to editing but I will get the hang of it very quickly with help from family and friends.

Kindest regards,
Dave

Good afternoon David.

Great to see a pure Amiga mag produced locally. I was impressed with the easy to understand writing style of the different articles.

How about considering this:

There are many people out here like me who have Amigas and only want to easily install and use various programs. We have either no wish, inclination, time or proximity for training to learn anything exept basic skills required for these installations. In fact we wish everything was completely automatic!

Would it be possible to have a small help column which doesnt explain so much as show how to do simple things for various routines. Eg: We run an A2000 and 3000 for our small business.

When we buy a program that looks or reviews well, we invariably get stuck on simple things such as ASSIGN: etc. Result - it takes weeks to get someone to come and sort out the mess. If we cant get anyone - we get frustrated and really feel disadvantaged by owning the Amiga.

It is easy to see why small business goes for IBM DOS - there is plenty of help out there to set the system up.

Multitasking and the Amiga helps with suppressing frustrations!

Once again - keep up the good standard you have shown to date.

Best regards,
Tony Carmody
Qld

Hi Tony,

You seem to agree with most of our readers, in that it is good to see another locally produced Amiga magazine come into the Australian market. I am very glad about this myself because it was definately not an easy road from conception to publication.

We understand that just because someone owns a computer it does not necessarily mean they automatically understand all the technical jargon that is associated with it. This is why we try to keep our articles as easy to follow as possible.

I really have to sympathise with you regarding your setting up problems as I had similar trials myself when I first purchased my Amiga. We all know how under sung the Amiga song is in this country for various reasons. In an effort to change this and to help you and others in your predicament, I will initiate a help column that will address some of the problems that new users encounter.

We aim to make OZAmiga a household word with Amiga users around the country.

Many regards,
Dave

Dear Raff Lerro,

Thank you for your article in OZAmiga Edition 4. I was especially interested in your mention of "A Terminal Emulation called 'VideoTex'".

My query is, is there an Amiga terminal program which gives 'VideoTex

Emulation' (1200/75 7-E-1) for a plain Amiga 500 and a 2400 baud modem.

I hope so. Looking forward to your reply, possibly through the magazine, which is well worth the cover price.

Yours Faithfully,
Peter Spowart
N.T.

Dear Peter,

Yours is the first letter we have received that is directed at a specific article. I would like to thank you for your intrest and hope it continues with future editions.

With regards to the 'Terminal Emulation' program about which you requested information, the only software I know of that supports 'Videotex' is 'GP Term'. Videotex is a very old system that is now only in use in Britain and Australia. If anyone else knows of another terminal program that does support Videotex, could you please let me know as I have been looking for another one for quite a while. I don't particularly like GP Term (personal taste only).

The other thing you need to worry about is whether or not your modem supports the configuration needed (1200/75 7-E-1). About the only way to determine this is to read the manual that came with your modem, it should refer to V23 support.

Well Peter I hope this has been of some help to you and I look forward to hearing your comments on my continuing articles about communications. In this edition I look at Error Correction and Data Compresion. I have planned to cover things like archiving files and why we do it in future editions.

If there is anything else about using modems and BBSs that you would like me to address, then just write in and let me know.

All the best and many regards,

Raff...

Virtual Reality and the AMIGA

By: John Pospisil

One day in the very near future part of our lives will be spent in a Virtual Reality (VR) environment. Within the safe confines of a head mounted display (HMD), we will visit friends, keep appointments, design houses, play games, fight wars, learn and explore our most fantastic dreams.

More likely than not, the computer (or VR Engine as it's called) you will be using will be a future Amiga hooked up to the national fibre optic network, one of which AOTC is now installing.

This might sound like science fiction or speculation, but usable Virtual Reality systems exist right now. Every indication points to Virtual Reality being as revolutionary as television and the digital computer. If Commodore is smart, it'll make sure the Amiga is there when the revolution happens.

There might be people reading this who don't know what Virtual Reality is. For their benefit, we'll look briefly at current developments in VR.

We'll also look at the implications Virtual Reality might have for Amiga users.

VR allows people to interact with computers in a new way. Wearing a special helmet and data glove, the user feels totally immersed in a three dimensional world generated by a computer.

The user can control the computer through hand movements, which the computer interprets through the data glove.

The data glove fits onto the hand of the user, and acts as an input device. Sensors on the glove decode the user's hand movements so that the computer can interpret them.

The term "Virtual Reality" comes from the illusion generated for the user, who sees the computer generated world in the same sense that he or she sees the physical world. In the computer world Virtual refers to that which appears to be present, but isn't.

Until three years ago, the most VR research was carried out in the United States. Since then, Germany, France, and especially Japan have embarked on their own programs.

Japan believes it will overtake America in the VR field, and in one future scenario sees itself as the provider of VR hardware and the US as the provider of the VR software.

In America, VPL, Chapel Hill at the University of North Carolina and the Human Interface Technology laboratory at the University of Washington are the leaders in VR research. These centres have close links to NASA, the US defence force, Xerox, Autodesk, and Apple.

In Japan, a consortium including Hitachi, Toshiba, Nippon Electronic Co. and Nippon Telephone and Telegraph are rushing to create commercially feasible VR systems.

One spin-off from VR research is the Power Glove, a stripped version of the data glove which Mattel markets for the Nintendo Games Console, but licences from VPL.

In most Virtual Reality systems, the user wears a special helmet called a HMD (head mounted display) which contains two small television screens; one for each eye.

This allows the image generated by the computer to appear three dimensional to the user. The helmet prevents anything else from being seen, so that the user is completely immersed in the computer generated scene.

A sensor in the helmet tracks the position of the user's head, so that the computer can update the scene depending on where the user is looking. Users can manipulate objects by wearing a data glove.

The data glove has optical fibre sensors that detect how the hand is bending. Another sensor detects the hand's position in space. A computer representation of the data glove appears

in the computer scene, allowing the user to guide the hand.

In an effort to overcome the limitations of Cathode Ray Tube and Liquid Crystal Display screens in HMDs, HIT laboratories are developing a system by which a laser scans an image directly onto the retina by laser. The head of the team at HIT, Thomas A. Furness III, says that, "It's just a question of when it will happen."

There are two ways of using Virtual Reality; Telepresence and Virtuality.
  -Telepresence allows remote control of equipment / such as robots.

  -Virtuality, on the other hand, allows users to experience worlds that are likely to be dangerous or expensive to behold in reality.

The US Navy is experimenting with Telepresence. They have developed a teleoperated land vehicle which is driven by a robot, but controlled by an operator in a control van which is in turn linked to the vehicle by fibre optic. The operator sees a stereoscopic picture of everything the robot sees, and moves the robot's camera by moving his own head.

The University of North Carolina uses Virtuality in a system they have developed for use in drug design. Not only does the system allow scientists to see whether molecules fit together, but it allows them to feel if they do. They have also designed a system which allows you to walk through buildings before they are built.

The Virtuality 1000, a VR arcade machine built by British company W Industries, uses the Amiga 3000 teamed with a CD ROM and the latest Texas Instruments floating point maths chip to handle graphics.
  Virtual reality makes computer games more realistic than ever. They provide a first person perspective, rather than a third person perspective, as current games do.

These systems may seem impressive, but are nothing compared with what

leading gurus of the VR industry envision.

Jaron Lanier, the dread-locked, bearded founder and chief executive of VPL, sees VR as a new medium.

Speaking at conference on computer graphics, Lanier said:

"VR is shared and objectively present like the physical world, composable like a work of art, and as unlimited and harmless as a dream. When VR becomes widely available around the turn of the century, it will not be seen as a medium used within physical reality, but rather as an additional reality. VR opens up a new continent of ideas and possibilities. We have made the first steps on that continent."

Eric Lyons, of Auto desk, believes that VR is an *"inevitable technology."*

The only limitations on VR development at the moment is the hardware. Researchers are waiting for computers to get smaller, cheaper and faster.

A typical VR system costs around $US100,000 and comprises of two Silicon Graphics Iris computers, one for each eye, plus other hardware.

Leading authorities believe that VR will be common place in about ten years. The most optimistic say five years.

As mentioned, Amigas are playing an important role in the development of VR; being the centre piece of the first commercially available VR arcade machines. Interest in Amigas in the VR field is strong.

Eric Gullichsen, an ex Autodesk employee, who formed his own VR company, Sense 8 Corporation, likes the Amiga 3000.

The A-3000's custom chips for graphics, video, sound and other functions, impress him, as does its high speed 32 bit connections with other systems.

"The Amiga is designed for real time multi-media productions. Now we can integrate animation and video with VR," says Gullichsen.

The bad news for current Amiga users, is that unless you have a A-3000, A-4000 or maybe a A-1200, you won't be running VR worlds on your current machine. The 68000 is simply not fast enough to run convincing VR worlds, even with the power of the Amiga's graphics chips.

Virtual Reality is different from other mediums because it immerses users in a totally different environment. It requires total involvement by the user, and in this way, is different from radio, news-papers or television.

Virtual Reality has the potential of ushering in a true Global Village, where we not only see information from all around the world, but experience it.

Jaron Lanier, of VPL, sees VR as primarily a communications medium;

the telephone of the future. He believes people will be able to call other people, and share virtual worlds through fibre optic networks.

This might seem like science fiction, but fibre optic networks are being laid everywhere from Singapore to Canberra. Multi-user VR systems already exist. The combination of the two is technically possible, and there is no reason that one day it won't be.

In ten years, when VR starts appearing in the office, and even at home, Commodore will be in a prime position to take advantage of the ensuring information explosion.

In ten years, Commodore will have an updated, faster version of the Amiga 1200. A home computer which is affordable and graphically powerful; the perfect platform for a home VR system.

The next ten years will be an exciting time in the information revolution; especially so for Amiga users. At the Pasadena World of Commodore show in the USA, Commodore announced that it would abandon its septennial update program, and update their machines as soon as new technology becomes available.

What better indication that Amigas might be workhorse of a future VR network, rather than McIntoshes, cheap IBM clones or specialised Japanese machines.

There have been quite a few 'ADULT' disk magazines floating around the computer underground for some time now. Most of them have been nothing more than glorified slide shows that look as if they were produced by prepubecent boys.

The people at Twilight Zone have dedicated themselves to producing high quality adult entertainment which offers a whole lot more than just smutty slide shows.

Read stories and interviews and see the games. Games that will not be classed as childish (you know the type, wiggle

TWILIGHT ZONE

EROTICA

the joystick and the pretty lady loses her clothes) as are most of the adult games currently in cirrculation. Twilight Zone run regular competitions in each edition with prizes ranging from free issues to adult 'novelties'.

This disk magazine contains material of an explicit nature and covers many areas of human sexuality, whilst being presented in a highly professional and tasteful manner.

Twilight Zone is a monthly two disk publication produced in Applecross WA, it has a recommended retail price of **$25.00** and is '**NOT**' Public Domain.

Raff takes a good look at the

A1200

At long last the much talked about A1200 is here!

The Amiga A1200 is truly a magnificent machine. It has specifications that were only a dream to Amiga enthusiasts, and has most of the enhancements and improvements that Amiga users have wished for.

Brief Specifications.

Processor : 68EC020 surface mounted on motherboard to improve reliability. Pads on motherboard for math co-processor. (option?)

AGA chipset : Advanced Graphics Architecture chipset.
Features of the AGA Chipset include;
  *256 colours from a palette of 16.7 Million!
  *Full 32 bit chip ram access =more speed!
  *Many new display modes including Double Pal and Double Ntsc with NO FLICKER.

RAM : 2 Megabytes of Chip RAM as standard. Expansion via Credit Card PCMCIA slot or trapdoor slot.

Hard Drive : Internal 2.5 inch IDE Hard Drive.

Expansion : PCMCIA card slot, trapdoor. 4 meg of 32 bit fast ram in trapdoor or 4 meg of 16 bit fast ram via credit card slot.
(not A500 comp atible)

Operating System: AmigaDOS version 3 containing Cross DOS as standard.

The machine I was able to try briefly had a 4 megabyte ram card in the PCMCIA slot, giving 6 megabytes total RAM, and was an A1200HD40 that contained a 40 megabyte internal IDE hard drive, as standard.

The A1200 looks very much like the A600 with a numeric keyboard, in other words it is white, has the card slot on the left side of the machine, has the usual serial, parallel, video, and mouse/joystick ports etc at the rear, and

has an 880k floppy disk drive on the right hand side of the machine. That's right NO high density drive, (Yet). It is about as long as an A500 but not as deep, and has more of a slope towards the front.

Paula (the sound chip) is unchanged apart from being surface mounted. which means the sound capabilities of the 1200 are the same as the current 500/2000/3000 series machines.

So what's it like?
Well being used to my A2000 with workbench 2.1 and a GVP SCSI card with 7 meg of RAM and 2 hard drives, I must say that this beastie is quick! It would have to have one of the fastest IDE hard drives I have ever seen, icons appear on the screen extremely quickly when you open a window, and the general feel of the machine is very slick. I'm lead to believe that Kickstart/ Workbench version 3 has had some major speed improvements coded into it's workings, so this may explain part of the speed improvement, but it is definitely quite a bit quicker than my trusty A2000.

Preferences is where you will find one of the first clues that you have some new chips on board. When you load up the palette program to modify the palette, you will be presented with a neat way of selecting colours. This new version of the palette program has a colour wheel displaying 256 colours at once, blending via shades into one another. You can move a little widget around with the mouse within this wheel to select just the shade you like. Very nice! You can also modify your selected colour's R G and B values via sliders.

Also in the preferences drawer, you will find that there are new screen modes and monitors available. Some of them with 256 colours available from a palette of over 16 million, that's true 24 bit colour.
There is a new 8 bit HAM mode that provides 256,000 colours for truly realistic and photographic quality

pictures.
There is also a new tool in Workbench 3 to prepare cards inserted into the PCMCIA slot. This program sets them up to be a RAM disk or FastRam etc, and is quite powerful but easy to use.

Fortunately, the AGA chipset is quite capable of dropping back to ECS mode for compatibility with older programs and games. There is also a menu available on bootup to select which mode you would like the machine to be in.

To me AmigaDOS version 3 looks very much like version 2.1 that I'm currently using, barring of course the palette and screen mode requesters etc.
The workbench screen looks very much like it does under version 2.1, as do the supplied icons, workbench tools and utilities.

I'm led to believe that there is provision on the 1200's motherboard for 68881/68882 co-processors to be surface mounted also, which sounds like maybe there will be other models or options available in the range.
It also means that all you hacker types can equip your machines with a math co-processor quite easily, once the warranty expires.

The monitor supplied with the review machine was a Commodore 1960. Unfortunately it was unable to display all of the new screen modes.
I am told that there may even be a new monitor on the way soon.

I had a chance to try one of the few programs available as yet, that uses the AGA mode of the new chipset.
The program is called ZOOL and is available from Electronic Arts.
It is really amazing to see an Amiga displaying 256 simultaneous colours. Zool is also a neat game set to take on Super Mario and Sonic the HedgeHog!

All in all this machine is the future of Commodore computing, it provides an amazing amount of power for your money and with AmigaDOS 3, is a pleasant and efficient way of using some of that power. At around $1500,00 for an A1200HD40, it represents resonable value for money and with the PCMCIA cards becoming a new standard, comes equipped with the cutting edge of technology. The prices of these cards while as still quite expensive, should come down with more machines making use of this new technology.
Thanks go to Garth at Video and Audio in Southport for his time spent in showing me the A1200HD40, and answering my many questions!

AMOS
COMPETITION

Entries can be games or utilities but must fit on 1 disk

WINNERS announced in EDITION 8

WIN your own copy of AMOS PROFESIONAL RRP:$229.00

AMOS

CanDo VERSION 2

Have you ever looked at a program and thought "If only they had written it this way or made that easier" or "I'm sure I could write better software than that. If only I could program the Amiga!". Well, now you can or rather CanDo! Version 2 of the program has just been released and adds even more features to the already versatile program.

Configure CanDo

Groups...
Card
Coordinates
Deck
Editor&Tools
FileRequester
General
Objects
Paths
XtraToolsMenu

XtraToolsMenu

Exit

Available Tools...
BookMark
ConfigCanDo
DosNotify
Error
GamePort
LastBookMark
MenuRender
ObjectLayer
Proportional

Tools Menu...
ConfigCanDo   1
SuperDuper   2
ARexx   3
RightMouseButton 4
GamePort   5
ObjectLayer   6

Clear   Default

Save   Use   Revert

For those of you who are not familiar with CanDo, it is an "interactive software authoring system". It allows even a casual Amiga user to produce programs that have the look and feel of "professionally" written software with windows, menus, buttons and gadgets without understanding the inner workings of the Amiga. Using a "point and click" interface and a methodical approach, one can produce quite complex programs quickly and easily.

If you have a knowledge of Basic or other high level language, it is possible to produce very sophisticated and powerful applications. Having a paint program and audio digitiser will also allow you to add that extra bit of polish to your applications.

CanDo requires at least 1MB of RAM and two floppy drives. I found that CanDo really benefits from having a hard drive and at least 2MB of RAM. An accelerator also gives the program a bit more "zip". The software comes on four disks and is not copy protected.

Installation is via the standard Commodore installer program.

New features to Version 2 include the ability to set and use a grid for placement of buttons, support for images up to 1700 x 2200, a built in configuration utility, support for the DOS Notify object in Kickstart 2.0, and many other improvements including a new 400+ page ring-bound manual.

There are too many other features to list suffice to say that it is quite a complete package. There are numerous button and highlighting types, event scripts, border styles and text rendering options. BrushAnim support is built-in as is ARexx. Such things as support for joysticks and CDTV are there as well as the ability to detect the insertion of a disk.

I found myself creating "Decks" as they are called, quickly and easily for some of the CLI only

programs that I use. By putting a "GUI" (Graphical User Interface) on these utilities, I found that I did not have to remember the various switches and modes that were possible. All I did was

```
MakeDocument "Name List"
WorkWithDocument "Phone Data"
MoveCursorTo STARTOF DOCUMENT
Loop
    Let NAME = GETWORD(THELINE,1,"»")
    Let WORKPHONE = GETWORD(THELINE,6,"»")
    Let HOMEPHONE = GETWORD(THELINE,7,"»")
    WorkWithDocument "Name List"
    Let SPACES = "                    "
    Type GETCHARS(NAME||SPACES,1,30)
```
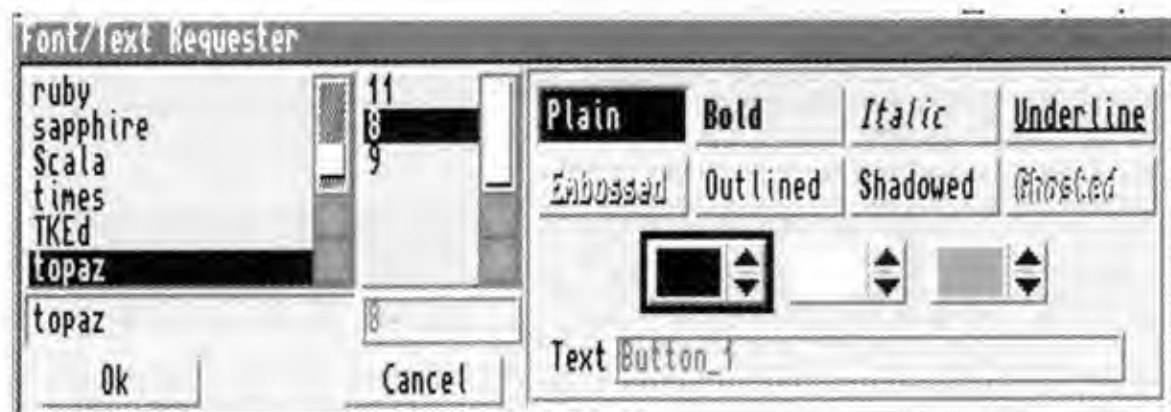
create a series of buttons for the different modes and by adding a file-requester to my "Decks" I had produced a stand alone program that anyone could use.

There are already a number of commercial and shareware programs written with CanDo and I am sure that we will see many more.

ARexx and the AnimManager utility) and the ability to selectively "bind" only the parts of the library that are needed rather than the whole library. This last issue would allow the creation of much smaller files for distribution.

Font/Text Requester

ruby	11				
sapphire	8	**Plain**	**Bold**	*Italic*	Underline
Scala	9				
times		Embossed	Outlined	Shadowed	Ghosted
TKEd					
topaz					
topaz	8				
Ok	**Cancel**	Text Button_1			

Overall, I can recommend this program to anyone who has been itching to "write" their own programs but have been intimidated by the majority of programming tools to date. You don't need a degree in computing to produce something useful and

Programs produced with CanDo can be "Bound" for distribution which means that the Deck cannot be modified by the user. You can also "Mult- iBind" a deck to incorporate any graphics, text or sound into the one file therefore making install- ation much simpler for the user. The down side to "MultiBinding" a deck is the size of the resulting application is quite large (over 100K for even the simplest of decks).

Some people have compared CanDo to AmigaVision, ScalaMM and AMOS. In some respects, it has some similar-ities to all of them, however it is much more flexible than AmigaVision or Scala and much easier to use than AMOS.

CanDo still lacks a few features that would make it the best all round authoring package. This includes built-in wipes and transitions for displaying images, direct support for animation files (although it can be done through

besides, it is a lot of fun.

Reviewed By: **David Jacobs**

Supplied By: **Desktop Utilities**

RRP: **$269.00**
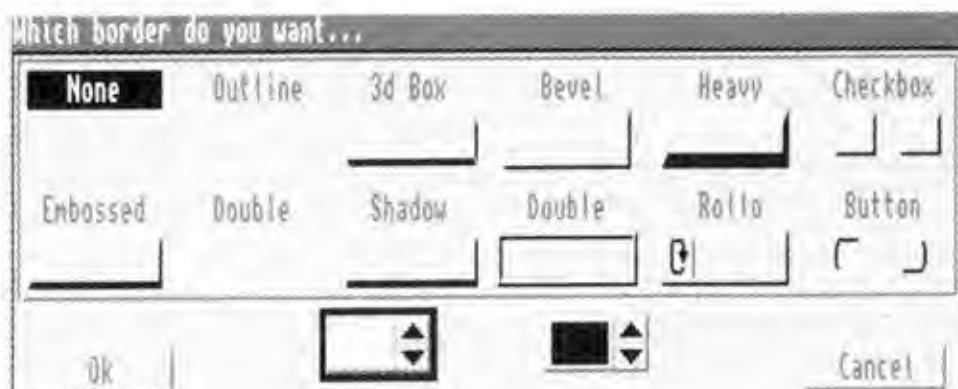
Which border do you want...

| None | Outline | 3d Box | Bevel | Heavy | Checkbox |
| Embossed | Double | Shadow | Double | Rollo | Button |

| Ok | | | | | Cancel |

AMOS

With Neil McKnight

Last time we looked at some of the simple graphics and drawing commands available in AMOS. This time, we will continue where we left off and introduce a few extra commands as we go.

We used the Colour command last time to set the colour of a pen. We can use the very same command in a slightly different way to read what colour a particular pen is at the moment.

> <$RGB>=COLOUR(pen)

In place of <$RGB> we would place a variable name like "Hue" to remember it for later, or we could use Print to display the value. The number in <pen> is just the pen you want to look at.

We can also tell what pen was used to colour in a particular point on the screen. The command for this function is called Point. It's used like this:

> <pen> = POINT(x,y)

The values for <x> and <y> can be any point on the screen. <pen> will be the number of the pen used.

For all the line drawing commands, you will have noticed that they all used solid lines. It is possible to change this to use all sorts of dotted and dashed lines.

To change the style of line drawing, use the command Set Line. The syntax for this is:

> SET LINE %pattern

In this command we use a 16-bit binary (Base 2) number to show the sort of pattern we want. Using a binary number allows you to get a pretty good idea what the line will look like even before you draw it.

In the examples below, a 1 signifies a dot and a 0 the lack of a dot.

Examples:

> SET LINE %1111111111111111
> = draw a solid line (normal)
>
> SET LINE %1111000011110000
> = dashed line
>
> SET LINE %1000100010001000
> = dotted line

Last time, we used the Polyline command to draw all sorts of hollow shapes, and the Circle and Ellipse commands to draw hollow circles. Using the Paint command we can fill in those hollow shapes.

The Paint command is used like this:

> PAINT x,y,mode

The point specified by <x> and <y> should be somewhere inside the hollow shape. <mode> is an optional switch that controls how the fill behaves when it reaches the edge of your shape.

To create a filled circle, try this:

> CIRCLE 100,100,50
> PAINT 100,100

Please note that Paint will completely fill the screen if there are any gaps in the shape.

AMOS also provides a good range of different fill patterns when drawing solid shapes, such as with the Bar or Polygon commands. We introduce a new command called Set Pattern which allows us to select one of the 30 different fill patterns to use.

SET PATTERN pattern

The number <pattern> will be used for all subsequent solid shapes. To return to normal, type:

> SET PATTERN 0

Ok, now we have a screen full of all sorts of lines, shapes and patterns. Can we save it as a picture, just like Deluxe Paint? Yes we can.
The command is Save Iff. Iff being the name of the standard way of saving information so other programs can read it.

> SAVE IFF filename$

If you replace <filename$> with something like "DF0:Screen.pic" then whatever is on the screen should be saved as a regular picture file.

To load it back again, or to load in ANY picture for that matter, use:

> LOAD IFF filename$,screen

Where <filename$> is the full path and name of the file you want to load and <screen> is an optional parameter which will set up a screen to fit the picture being loaded. Use 0 for <screen> for now.

About Bobs

As promised, we will begin our discussion on bobs. A bob is a special type of image that is controlled by the Amiga's Blitter. The Blitter is a special circuit that allows us to animate large parts of the screen. The name "Bob" is a short form of "Blitter Object".

If you have ever used Deluxe Paint, and most of you should have, then you will have seen how you can move a "Brush" around the screen and draw with it.

This is an application of bobs.

If you load up a picture using the Load Iff command mentioned earlier, you can try this out for yourself. Do this now.

To pick up an area of the screen use the command Get Bob. This syntax for this command is:

```
GET BOB n,x1,y1 TO x2,y2
```

As you can see, it's a lot like drawing a box, except that we also supply a number <n>. This is because we can pick up several areas at a time, not just one as in Deluxe Paint. If we grab several different images we can make an animation with them. We won't go into that until a later issue when we look at games, demos and such.

Select a suitable area of the screen and "grab" it, by typing something like:

```
GET BOB 1,100,100 TO 150,150
```

This will copy that area of the image into memory into a location we will call Bob 1.

Done that? Ok, well you won't actually see anything until you stamp that piece of picture somewhere else. To do that we use the opposite command Paste Bob. This takes the image we grabbed previously and stamps it back onto the screen.

Type this to stamp down the image:

```
PASTE BOB 125,125,1
```

You should see where the piece of image you picked up was stamped down overlapping the original area.

Just to clarify things, the syntax for Paste Bob is:

```
PASTE BOB x,y,n
```

As normal, <x> and <y> specify where the image is to go and <n> is the number of the image you want to use. You must use the number of a previously stored image or you will get an error.

That covers most of the simple drawing commands. There are a few more, but I'll leave them for you to play around with.

Next time, we look at some Mouse commands so we can draw things on the screen using the mouse, and work towards putting it all together to make a simple paint program.
Also we might look at colour effects such as flashing colours, colour cycling, fading and other interesting stuff.

Don't forget to write in and tell me what sorts of things you covered in this column. If you have a particular problem just send it to the address below.

OZAmiga AMOS Section
PO Box 567
Mirrabooka
WA 6061

Modems for the BBS user

Part 2
Error Correction and Data Compression

By Raff Lerro

Hi in this, part two of my series about data communications, I hope to help you understand the basics of Error Correction and Data Compression as it applies to you, the BBS user.

Data compression is used in two ways. Firstly the average BBS will have used some method of "Archiving" or compressing its files. This is done for two reasons the first, compressed or archived files are smaller and therefore take up less space on your hard or floppy disk. Secondly if the file is compressed and therefore smaller, it will take less time to up or download. This means less time online and this helps the old 'phone bill, especially at long distance.

Compressed or Archived files are smaller and therefore take up less space on your disks.

Also, Data Compression can be used by the modem itself. Modems that support data compression come in many shapes and sizes and tend to cost a bit more. There are quite a few different "standards" for data compression, just as there are for modems themselves. One of the most common series of these standards are known as the MNP protocol. MNP stands for Microcom Networking Protocol, Microcom being the mob who first created this protocol.

Now though, I would like to have a brief discussion about data archiving which is one form of data compression.

You have probably seen or heard about some if not all of the popular data archival programs used on the Amiga. Some of the common ones are (in no particular order):

    LHArc
    Arc
    Lz
    Zip
    Zoo
    Pak

There are many of these programs kicking around, as most of them started life on various IBMs and clones long before the Amiga was created. This is actually quite handy to us because it means that their compression methods are quite well sorted out and tested long before we go to use them on our trusty Amigas. It's not the whole program that is converted to be used on the Amiga, just the "algorithms" used in the compression and de-compression parts of the program itself.

This also is quite handy, as most of the time you can compress or de-compress your Amiga files on an IBM or vice-versa.
One of the better of these programs, and one in common use around here on the Gold Coast is LZ. It is quite quick, even on a standard "no frills" Amiga. It also achieves quite a good ratio of compression, reducing files down in size quite well without taking too much time to do so.
Most of these programs have command switches to alter some of their settings, for example how much compression and whether or not to include the original paths and sub-directory structures etc. As with everything there is a negative side to this in that more compression takes more time.
So as they say "You can't eat your cake and have it too!".

PD 24

Looking for some 24-bit images? We have a wide selection of IFF, GIF and JPEG images ranging from Erotica to Exotica as well as a library of 24-bit PD and Shareware programmes.

For a free copy of the current catalogue, write to:
PD 24
P.O. Box 143
Morley WA 6062

You, the user, will have to balance the compression ratio and the time taken yourself but generally the default settings are fine.
There are also "front ends" for some of these programs to take away some of the confusion caused by the myriads of options available, as a lot function via the CLI only. Another way of making life with your archivers easier is using "Diskmaster" or "Directory Opus" or a similar program. These excellent programs have support for archivers built in and the option to customize the operation and type of archiver you use.

Later in this series, I will endeavor to go into some detail about a few of these archival programs, with examples of their use, but for now, this will just be an introduction.
Next we go onto error correction and data compression as it applies to modems.

Error correction and data compression in modems is an equally complex subject. There are a couple of standards to be aware of, as there are a few traps for the new user. One such standard as mentioned before is MNP.
MNP currently has 5 classes or modes of operation, starting with MNP class 1, the most basic.

MNP class 1 is a very simple error correction scheme, similar in operation to X-modem. The modem assembles your data in blocks, and transmits these block by block. Each of these blocks has appended to it a CRC check and as each of these blocks are received at the distant end, they are checked for errors.

MNP class 3 is the first to achive a throughput of over 100%

A good error free block causes the modem to signal the sending modem to send the next block, erroneous blocks cause the receiving modem to request the sending modem to resend that errored block until it is received error free.

All this is done by the modem itself and your terminal sees error free data all the time, but due to the fact that MNP1 requires that the receiving modem send back acknowledgment for each and every block, it makes this protocol rather slow.

Asynchronous Data, really only means data with start and stop bits appended for synchronization.

MNP class 2 is similar to class one except that the modem can send multiple blocks of data, without having to wait for acknowledgment for each block. This makes class 2 MNP slightly more efficient than class 1.

MNP class 3 can is the first class of MNP to achieve a throughput of over 100%, and does so without using data compression.
It does this by stripping the start and stop bits normally associated with asynchronous data off leaving only pure data to be transmitted.
It's throughput is around 108%.
MNP 4 achieves even greater throughput than MNP 3 by allowing larger packet sizes for the data blocks, and reducing the overheads required in the error correction. MNP 4 can achieve a throughput of around 120%.

Finally, MNP 5 introduces modem based data compression, it actually compresses each data block within the modem before transmission. The distant modem then decompresses these blocks before presenting them to the attached terminal.
The compression routines used in MNP5 can achieve a compression ratio of 2 to 1, on text based data, achieving a throughput of 200%.
Data that has been previously compressed, will not be compressed further, and will actually take longer to transmit.
For this reason, if you are working with files that have been archived, don't use MNP5.

MNP functions in Asynchronous mode only, which for us is great.
Asynchronous data really only means data with Start and Stop bits appended for synchronization, which is the kind of data bulletin boards send and receive, and is used for up and downloads.

In the case of the modem that I have, which is a 9600 V32 modem, MNP works at the following speeds 1200, 2400, 4800, and 9600, note that there is no 14400 speed.

MNP also has three modes of operation: Normal, Reliable, and Auto Reliable. The error correction and data compression facilities are determined by the mode of operation.

Normal Mode. The MNP error correction facilities are disabled.

Reliable Mode, The MNP error correction facilities are enabled and are used for all data transfers, if the reliable mode is to be used then the remote modem must also support the MNP protocol. If MNP is not supported by BOTH USERS then the connection will be TERMINATED. Data compression is optional via command AT&E3 in this mode.

Auto Reliable Mode, (the mode I use) In this mode the selection of MNP reliable mode is determined at the start of the connection. The modem will AUTOMATICALLY select reliable or normal mode depending on whether the remote modem has these capabilities or not. As you can see the call won't be terminated just because the remote modem is not MNP capable, or has it disabled. Data compression is optional in this mode also, via command AT&E1, and the modem establishes whether or not to use data compression at first connection.

If you attempt to transfer archived or previously compressed files, the tranfer rate will DROP.

One thing to note here is, that unlike v42bis modems (the ones that have speeds like 14400), if you have data compression on and you attempt to transfer archived or previously compressed files, the transfer rate will DROP as the modem will attempt to recompress your already compressed data, thus reducing it's efficiency. V42 modems will automatically determine if your data is compressed and transfer it without attempting to compress it again.

Error Correction.

The error correction part of these modems is fine to use though, as it is then the modem which checks for errors in your received blocks of data, and the terminal then only sees good data, increasing efficiency.

The MNP error correction scheme employs a 16 bit CRC (Cyclic Redundancy Check) to detect errors in

the incoming data, and a "go back and" technique to correct any errors discovered. The CRC check will detect ALL errors which are 16 bits or smaller with 100% probability. The "go back n" technique requires that the remote modem resend all data blocks after and including the erroneous one. The result is an error free link as far as the local computer is concerned. Error correction is used only in the MNP Reliable and Auto Reliable modes of operation.

As you can see, there are a few things to learn about the ever changing world of data communications.

Data Compression.

The MNP data compression facility can provide an effective data rate HIGHER than the modem's transmission rate. This increase depends upon the type of data to be transmitted. If the data is mostly text based, then the increase may be up to 100%, in other words the effective speed is DOUBLE the modem speed.
If the data is a program or some other data which is primarily random in nature, E.g. programs and archived files, then the increase will be negligible.

To achieve a higher data rate than the modem's speed, you must enable your modem's CONSTANT SPEED INTERFACE, and set your terminal speed HIGHER than the modem speed. (I use a 9600 modem and set the terminal speed to 19200).
On my particular modem the command to turn the constant speed interface on is AT&I0, but yours may be different, check the manuals that apply to your modem.

For data compression to work both your modem and the remote modem must have data compression and error correction enabled.

An MNP only capable modem will still communicate with a v42 style modem, as the v42 one will interrogate the other modem at first connection and default to MNP mode, and determine what CLASS of MNP to use at first connection. They will usually try to use the highest available class that both modems will support, which because V42 supports MNP4 the two will usually connect using MNP4.

V42 is also a modem level error correction scheme that uses a protocol called Link Access Procedure for Modems or LAP-M.

It is similar to, but not compatible with MNP and it is better in many ways.

V42bis is another standard for modem level data compression.
It is similar to MNP in operation, but uses a more sophisticated algorithm to do the compression, archiving a possible throughput of around 400% of raw modem speed.
V42bis can also determine if your data was previously compressed, and will pass such data without attempting to recompress it, making modems which support V42bis popular choices for BBS's.

There are also some other "standards" for high speed modems but the most common that I have seen are these two.

For example the US Robotics HSR high speed modems, and Trail Blazer modems.
And there is some talk of 38400 and higher speed modems around, but they remain fairly rare at the moment and quite expensive, speed costs money.

If I can find out some reliable information about these modems I may write about them in a future article.

So as you can see there are a few things.

Did you know that with a little effort, the sound your Amiga produces can bring tears to the eyes of envious IBM compatible owners, and maybe rival even your home stereo's sound?

If not read on, and we will get that Amiga of yours really humming.

The sound quality produced by the built-in amplifier of your average 1081/1084 style monitor leaves a lot to be desired. It could be described as utilitarian at best but they work well enough for what they are.
But surprisingly a lot of Amiga owners do not realize the true Hi Fi sound that the Amiga is capable of, as they usually only hear the Amiga sound via their monitors.

By hooking up your Amiga to even a modest amplifier and set of loudspeakers, the sound quality will probably stun you. The Amiga contains as standard, some pretty decent sound electronics, that the typically standard old 4inch speakers and small amplifier of your monitor or TV just can't do justice to.

What we need is some cheap or surplus Hi Fi gear. Maybe in that shed of yours is an old forgotten amplifier and speakers or an old stereogram. If so, go learn about the ever changing world of data communications. Hopefully future articles will help both you and I to further understand the wonderful world of modems and data.

'Till next time,

BCNU
Raff..

and grab it, we have a use for it!

I fou- nd the amplifier and speak- ers that I use on my Amiga at a local pawn- brokers. The ampl- ifier is actually an amp, tape deck, and tuner all in one unit, this comes in handy for many uses. The speakers that I use also came with this amp, I managed to pick up the set for around $50.00

The point of all this is that if you search around at your local second hand store, or pawnbrokers you may just find some cheap equipment suitable for use on your Amiga. A friend of mine has one of those 'Ghetto Blaster' style portable stereos wired up to his Amiga and it produces some remarkable sounds.

How to get the best SOUNDS from your *Amiga*

By Raff Lerro

Once you have procured an amplifier and suitable speakers, all you need do is make up or purchase a connecting lead. You will need a lead with 2 male 'RCA' style plugs at each end, like those on your home stereo. If you are unsure of the right connectors look at the lead you have now plugged into the Amiga's sound output jacks, they are 'RCA' style plugs. You may find that if the amplifier you have is getting on a bit in years, or is a European amp, that it may need a 'DIN' type connector. Leads to fit these 'DIN' connectors with RCA connectors on the other end can be purchased from 'Dick Smiths' or 'Tandy's' or perhaps a Hi Fi store, take your Amp with you if you are not sure of the connectors you need.

Wire up the speakers to the left and right speaker connections of your amp, connecting the same way for each side for best sound quality, then plug your lead into the Amiga's sound output jacks and the other end into the 'Aux' input of your amp, if your amp does not have an Aux input then an input marked "CD" or "Ceramic Phono" would do. On no account try plugging into a input marked "Magnetic Phono", "Phono", or "Turntable" as the sound will be horribly distorted. The Amiga's sound levels are too much for these inputs. Nothing should be damaged though if you accidentally plug into one of these inputs, it just won't sound very nice.

When it's all connected, turn it on and enjoy the wonderful sound. Be careful with that volume control though, the Amiga is quite quiet when it's not making any sound, and you may blow up your speakers if you have it set too high. Run a game or play a sound module an ease the volume control up to get the level you desire.

I have found that two small enhancements can be added to this setup. You may find it handy to have BOTH the monitor AND your new setup producing the Amiga's sound, I have mine wired this way for convenience. As you don't always need 100 Watts of sound for your Amiga to beep at you when you do something wrong!

It is relatively easy to do this, all you need are two 'Y' cables with one male 'RCA' connector on one end and two female connectors on the other. You can get these also at Tandy's or Dick Smith's, or if you are feeling industrious, make your own to suit. Just plug them into your Amiga to provide two outputs, one for your monitor and one for your new sound setup. Plug the amp and the monitor into these ouputs and they both will operate together.

The other enhancement is to provide a switch on your Amiga to alter the Amiga's built-in sound filters manually. Very handy for older demos and games, as they sometimes don't switch these filters out.
There is a PD utility or two to do this in software for the A500/ 200 and 3000. I think one is called 'LED' and it should be available where you get your PD software from.
I may describe how to go about doing the hardware switch in another article. It all depends on your response! dear reader, so send in some feedback on what you'd like to read about and what hardware hacks you'd like to try. Then we'll see what we can do for you.

Feb/Mar CoverDisk 5

Assembly Source	SlideShow	Docs	Virus Checker

EXIT LANE — OZAmiga CoverDisk — FEBRUARY 1993

Assembly Utility	Deli Tracker WB1.3	Deli Tracker WB2.X	SnoopDos

The CoverDisk is compiled by Van Diemen Computers and coded by Geoff Scheimann

Virus Checker

Written by John Veldthuis from New Zealand, Virus Checker is recognised throughout the world as one of the best virus utilities avalable.

Everybody knows (or should know) what a virus is and what it can do to your sofware. The only way we can combat these destructive little beasties is to perform regular checks on all incoming disks. As you can tell by the version number, John updates the utility as often as possible. We will endeavour to bring you future revisions as they are released.

SnoopDos

This is a small utility that will be of immence help to anyone that has ever tried to load a DOS program and had it fail, giving no indications as to why?

If you run SnoopDos without setting any options and then run an application package, when you exit the program SnoopDos will display all of the system calls made by the program. This can be helpful if the program is calling for something like a library, device or font that is not available. You may then be able to fix the problem by simply making available the missing file.

Assembly Utility

Instructor is brought to us by Grace Goose Software in Queensland. This utility will become a must have for all those that like to program in Assembly Language.

The program is essentially an on-line refference manual for the 68000 microprocessor Assembly Language instructions.

ABCD	–	Add BCD with eXtend
ADD	–	Add Binary
ADDA	–	Add Address
ADDI	–	Add Immediate
ADDQ	–	Add Quick
ADDX	–	Add eXtended
AND	–	Logical And
ANDI	–	And Immediate
ASL	–	Arithmetic Shift Left
ASR	–	Arithmetic Shift Right
Bcc	–	Branch On Condition Code
BCHG	–	Test Bit and Change
BCLR	–	Test bit and Clear
BSET	–	Test Bit and Set
BSR	–	Branch to Subroutine
BTST	–	Test Bit
CHK	–	Check Register against Bounds
CLR	–	Clear
CMP	–	Compare
CMPA	–	Compare Address
CMPI	–	Compare Immediate
CMPM	–	Compare Memory
DBcc	–	Test, Decrement and Branch On Condition Codes
DIVS	–	Divide Signed
DIVU	–	Divide Unsigned
EOR	–	Exclusive Or
EORI	–	Exclusive Or Immediate

Up to a page or more of information is available on each of the op-codes and their usage.

Its great to see this sort of quality work being directed to making programming easier for everone. I take my hat off to people like Tom from Grace Goose.

SlideShow

Geoff Scheimann has put this Boot Block Slide Show Maker together to help you to put your classic artwork into slide shows.

When you enable the program you are asked to select pictures. Pictures can be lo-res or hi-res (Interlaced or plain). It will even work with some HAM pics.

After you start your picture selection you keep going until you have filled the entire disk.

What the program actually does is to write your pictures into the boot block so that if you try to read the disk with a file utility, you will get a 'non-DOS Disk' message.

This can be very handy if you wish to show your pictures off without allowing every Tom, Dick and Harry finding their own use for them.

Assembly Source

Under this button you will find some source code supplied by Chris Leathley to use in conjunction with the Assembly Tutorial on page 23. Each edition Chris will supply portions of code to make your life a bit easier.

Deli Tracker WB2.X

Delitracker is a sound player with a difference.

With this terrific little sound player you can listen to sound files that are saved under many different formats. Some of the most common players are included, like;
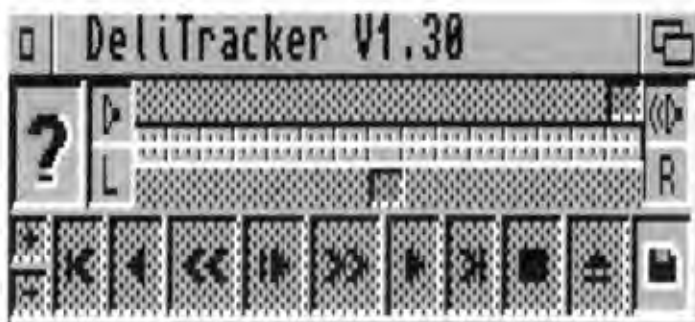
SoundTracker
NoiseTracker
ProTracker
StarTrekker
CustomPlay
and MOD

The ability to add more players to the 'DeliPlayer' directory makes this program quite versatile. DeliTracker is NOT a song editor, a MIDI sequence or a digitizer. It is designed to make listening to music simple.

DeliTracker works well as a background task, and is a rather small file so can be used anytime. They have even been thoughtful enough to include AREXX support.

Hope everone has heaps of fun...Bye...

DeliTracker V1.30

DeliTracker Preferences

Copyright by Delirium in 1992
Release Version

Name   Version

Creator

Volume........   Balance.....
Patternjump...   Playspeed...
Subsong.......   Packable....

6 Players available
SoundTracker15
SoundTracker31
NoiseTracker
StarTrekker4
ProTracker
Customplay

DeliPlayers   ADD DEL

☑ Quick   ☐ Filter   Load CFG
☐ Random   ☐ Append   Save CFG
☐ Songend ☐ Fadeout Save List
0 Time Config   OK

NOTE:

It was originally intended that a certain amount of assembly code would be available under the button marked ASSEMBLY SOURCE. Unfortunately this did not happen as expected. We apologise for this omission. In its stead we have included a selection of AMOS procedures which can be loaded into AMOS under the title Procedures.AMOS.

```
P R A N A L O G D A S S E M B L E R B
U E E B M S W R E S E H T P I E S O Y
B U R N H D O I F C N A O T T B S M T
L I M I T U R D E I N T R L A C E E E
I G F C P U K U N I A E E R T U O G S
C T F C A H B X C U R S O R D P R T C
D I M H L C E V E N T T A E M A R S A
O M P I A O N R E L L M E R P I N E P
M E O P E P C B A P P L E H N S N A E
A R R A Y Y H H H L C V I G U B I A H
I S T B W P U K C A B C D E V N I S L
N E T W O R K I N G S C C B Z R E Y I
T I M E P O B J E C T T R L I R U N B
E L I N E T K A R G S A A E I N M C R
R B B S N E A G C O M M A N D P A H A
F Z S L O C C O D E T R L E H T M R R
A P L O T T E R A F T O O B E E E O Y
C E R O U H D I O D E F C D D T G N N
E D I T O R I A L A S E R O O O B O E
P R O M P T C J P U D M T L A E R U D
S C R I P T I E U S H I R O T C E S T
```

WIN
$20.00

This word find was sent in by Debbie F-Smith from Port Hedland. I was able to find approximately 40 computer associated words of three letters or more. If you can do better than that, send in your word list and you could win the $20.00 prize.

Send entries to:

**Word Find Edition 5
PO Box 567
Mirrabooka
WA 6061**

AMOS is already proving to be a popular programming language. The recent release of AMOS Professional is the latest addition to programming with AMOS and is aimed at all levels of user.

A major revision has seen the release of this totally new product, providing more features and scope to an already powerful system. AMOS Professional is more than just an upgrade, it is a truly professional system.

The first thing I noticed was that there are a lot more disks. Six of them. There is a System disk, a Tutorials disk, a disk full of Examples, a set of brand new Accessories and two disks of fully fledged games and utilities, named Productivity 1 and 2.

Next comes the manual. It is well written and understandable, with sections for beginners, right up to the more technical areas. A much better manual than the one supplied with the original AMOS.

First time users will find the early tutorials helpful in coming to grips with the new system and exploring the different commands. Seasoned users can quickly find out what's new and will find the additional material helpful.

Installing AMOS Pro on a hard drive is painless. The supplied install program takes care of all the necessary hassle with a minimum of disk swaps.

The Editor

When AMOS Pro appears on the screen, you notice straight away that

some major revisions have been made. The Editor screen is quite different from what I was used to.

Programs are now written in windows. These may be layered on the screen several at a time. Much better than swapping screens as before. Accessory programs are extensively used and available directly from a menu. There is even an Auto Save function.

All operations can be performed using menus and keyboard shortcuts. The original key controls are used wherever possible. There is a dual memory meter showing Chip and Fast memory usage at all times - great if things are tight. Everything is configurable, much more than previous versions, using various configuration programs that load directly through the Editor.

A row of icons along the top of the screen have replaced the named buttons of before, giving more usable work area and a more intuitive feel. Most people should take to the new system quickly.

Direct Mode also features icon control. The screen is resizable using the mouse, and features command line history, just like the AmigaDOS Shell.

This makes Direct mode more like a work area than somewhere to type an occasional command.

Overall, the programming environment is much easier to use.

So, What's New?

AMOS has grown considerably with this release. There are now over 700 commands and some totally new areas. Most sections have undergone revision, evident by the many extra commands you will find hidden amongst the more familiar ones.

For a start, there are some 7 odd new commands for using AREXX. The addition of an AREXX port makes AMOS useful for some serious progra-

mming when used in a multitasking environment. Another new section allows IFF Animation control. Now you can load and play full screen animations directly within your programs. This allows AMOS to be considered serious competition as a Multimedia package, offering unrivalled flexibility in this area.

Music has always been well supported. Extra commands cater for MED modules, as well as Sound Tracker modules and MIDI. In all, another 10 or so music commands have been added.

Device control was a bit of a problem for earlier versions of AMOS. The Serial extension went a long way to remedying that.
Now, AMOS Professional goes much further. Not only can the Serial port be controlled, but an extensive set of Printer and Parallel port commands have been added. The new printer commands include a screen dump facility and directory printing, as well as raw data dump and extensive checking.

The Parallel commands support both reading and writing to the parallel port. This opens up a myriad of possibilities for using external devices.

You are no longer limited to 15 Memory banks. Now you can have up to 65000 of them! Extra commands have been added to cope with them, such as ERASE ALL.

A new type of bank, called a Resource bank, allows you to store picture elements and strings in the same area. This is used as source material for Dialog boxes, or for program data.
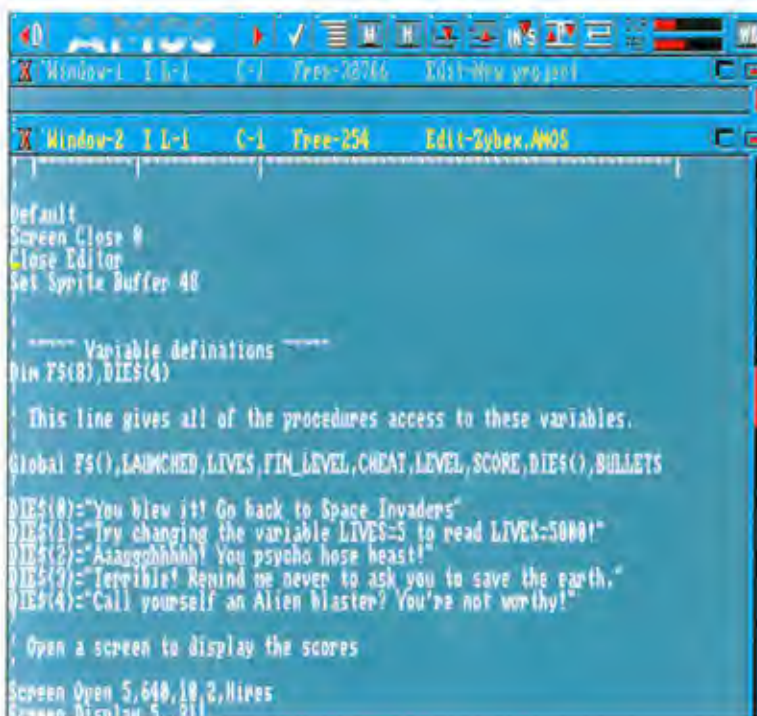
A new accessory program manages all of this for you.

Like AMAL and the embedded menu commands, the new Interface System allows you to create entire interface panels and dialog boxes and run them as independent programs.

There are over 60 new functions to create buttons, sliders, switches and edit fields, both text and numeric. A wealth of controls allows you to design them exactly how you want, using images and text stored inside a resource bank, or using the in-line graphics commands.

Extra Dialog Box commands exist to control the completed panels.

For the more technical programmers, you can now access external system libraries and call on them, just like other languages.

Also, you can now include other files into your code like 'C' does. These files won't appear in the listing, but get included in the code just the same. This makes writing larger programs a breeze. Libraries of already debugged code can be included wherever you want.

The addition of an ELSE IF statement also helps for all those people who pine for a CASE statement, and simplifies complex IF..THENs.

Most commands now have an inverse. You can now insert a bob, sprite or icon, and even shrink a bank if necessary.

Quite a few commands appear that solve particular programming problems, like "is the printer ready" and such. This shows that every effort is being made to make AMOS Pro a useful programming tool for all types of programs.

The File Requester now remembers directories and is more efficient when reading a floppy. More controls and a better interface make the standard file requester the preferred choice. Much improved over previous versions.

Briefly, some other areas of AMOS Pro that come to mind are the Read Text command, Hypertext capability, the good range of new accessories, examples and tutorials supplied and the handy on-line help system that gives an explanation of any command you require.

Although most AMOS 1.34 code works perfectly, there are no 3D or compiler extensions yet. This means the Squash and Unsquash commands are not present.

Your programs will run through the interpreter at about the same speed as AMOS 1.34.

I did find a few bugs that haven't been fixed yet, when using sequential datafiles. For example the following code does NOT work.

```
Open Out 1,"Ram:Test.dat"
Print #1,a,b,c
Close 1
```

```
Open In 1,"Ram:Test.dat"
Input #1,a,b,c
Close 1
```

Print# sends tabs instead of commas, so Input# sees only one variable not three, and each line in the file is terminated by a carriage return/line feed, which is not standard Amiga format, but that for the Atari ST. Probably a carry over from the original conversion from STOS.

The Solution:

```
Open Out 1,"Ram:Test.dat"
Print #1,a;",";b;",";c;ChrS(10);
Close 1
```

```
Open In 1,"Ram:Test.dat"
Set Input 10,-1
Input #1,a,b,c
Close 1
```

If anyone else has any problems to report, please send them in to:

AMOS Help
PO Box 567
Mirrabooka
WA 6061

Overall, AMOS Professional is an excellent programming language. The enhancements and extensive modification to the basic system more than warrant the release of the new version. The future should see AMOS becoming ever more popular and the preferred choice for both new and experienced programmers.

RRP for AMOS Professional is:
$229.00

Upgrades are available from <<ED>> for $106 and the cover of your old AMOS manual.

Reviewed by:

Niel McKnight

Review copy supplied by:
Headlam Computers

Pictures from Example Programs

Public Domain

Each edition I will endeavour to take a look at a couple of the great PD programs that are available through various PD retailers. Not all of the programs I look at will be new but I will try to make them useful.

I have had a certain amount of requests for information on some of the Public Domain programs that deal with education. There doesnt seem to be a great deal of it getting around, so I will have a quick look at four programs that are part of the Fred Fish collection.

THE MATHS ADVENTURE - In this game you are given ten rooms, each containing a question and a clue. To get the clue you must answer the question correctly (obvious huh). The puzzles vary in difficulty from easy to impossible. I sat down to this game and got up two hours later with severe brain strain and I hadnt even got past room five. This game is designed for those over the age of 12.

DIVISION - There are two parts to this game. The first is a practice module which will continue to give questions for ever, while the second is a Test module where the student is given 20 division problems and a time limit. After all have been done (or the time runs out) you are given your score. A great help for children struggling with this subject at school.

c|Counting Fun....
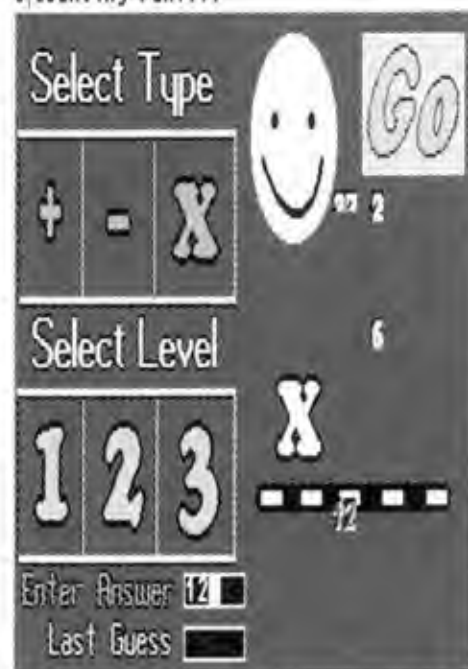
COUNTING - In this game you can choose to work on Addition, Subtraction or Multiplication. There are also three levels for each type of maths, this makes it a bit more of a challenge for the older kids.

When you have selected the type of maths and the level of play, you just hit GO and start answering questions. You are given two attempts at each one befror it gives you the answer and the next question.
All actions are accompanied by suitable sound effects to keep the younger kids interested.

CATEGORY: MULTIPLICATION
You took 123.7 seconds and answered 38 questions correctly.

Final percentage mark,
72.978%

Final comment,
VERY GOOD

PRESS RETURN TO CONTINUE

REFLEX TEST - This test also deals with Addition, Subtraction and Multiplication but with this game your overall final score is calculated on both the number of problems answered correctly and the time it took to answer all 40 of them. This is a good game for sharpening those mathmatical skills that have been left to rust.
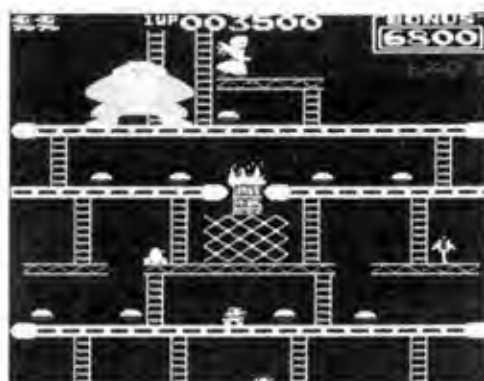
DONKEY KONG has finally been converted to run on the Amiga.
Yep thats right, the forerunner of Super Mario, the favorite of kids everywhere is here.
Control Mario as he tries to save his girlfriend from the clutches of the evil Kong. Jump barrels, get a hammer and smash barrels, either way it doesnt matter as long as you get to the top. This version of Donkey Kong has been given an extra level for those that have played the game extensively. Best of luck and have fun...

JESUS ON-E'S

WATCHMAN.

Phantasmos..

The Magic Morphing Machine.

Morphing pictures has become the past time of many Amiga users of late. So when Brad gave me the opportunity to look at at Public Domain program that can do it. I was very interested. Phantasmos will morph structured art (as created in Professional Draw) or any Amiga IFF (scanned or drawn images), such as a picture created in Delux Paint.

There is, however an advantage to drawing your pictures within the Phantasmos program. This is basically that the morphs can be synthesized 20 - 30 times faster than the imported images. Also morphs created in Phantasmos have a much smoother transition.

It is possible to achieve 72 different ways to morph between one image and another. Approximately 24 of these capabilities alter their morphing characteristics everytime you use them, giving you that random picture. Naturally Phantasmos gives you most of the drawing tools you would find in any structured drawing program. There are a few extras, like having specific frames LASER drawn onto the screen (quite effective).

There is a bit more work involved to create a morph using Phantasmos but it is much cheaper than the commercial packages.

If you would like me to chase down any specific style of Public Domain for review. the just write in and let me know. the address to write to is,

PO Box 567
Mirrabooka
WA 6061.

Also uder the heading of Public Domain are the Demos. These are put together by a wide variety of people all around the world and are designed to show off the quality of audio visual work possible on the Amiga.

This latest one takes up two disks and runs for a staggering three hours. It is

the Demo, the programmer has made extensive use of silhouettes that are only on screen for a fraction of a second, this gives an effect much like subliminals. The music throughout this Demo is constructed like the Techno Rap common in Europe at the moment. It is obvious that a lot of work has gone into the making of this work of art (what else can one call it?), so if you get a chance to see it, do so even if you don't watch the whole three hours.

made up of many colours and pictures doing wonderful (or terrible depending on your point of view) things to your eyes. The trick is combining music with the pictures and getting them to synchronise whilst still being pleasant. To obtain the best effect possible from

Many thanks go out to Brad and Sandy at *Amilight* in South Perth for supplying all the PD for review. Most titles are available from all good PD libraries.

SimEarth

which species belongs where, what to do about those damn bushfires and how to stop that ice age that keeps trying to creep up.

The package comes with a well designed manual which is easy to follow and easy to understand. It has the almost compulsory quick start guide for the people who want to stick the disk in and go for it. Lots of pictures and diagrams make it easy to understand what is going on.

Sim Earth comes in a Hi-res and a Lo-res version - both packaged together and this means that people who have their Amiga hooked up to a television don't have to suffer that much while monitor owners get the full detail. The Hi-res version requires two meg of RAM (one meg chip) while the Lo-res version will work with one meg. A hard drive is also recommended. It is a

If creating a thriving metropolis in Sim City wasn't enough for you, then try your hand at an entire planet.

Maxis have unleashed SimEarth onto a market that can't seem to get enough of these 'God' games.
Sim City was the first, then came a whole flock of games based on the same principle, that is the player is God. Sim Earth takes it out of the city and makes you the creator of an entire planet.

You have to balance the ecosystems and make your planet evolve through the different levels of the evolutionary scale without ruining the planet. That means you have to think of everything - what type of vegetation goes in which area,

DOS disk and it requires kickstart 1.3 or higher and because it is a DOS disk there is no special copy protection on the disk - but you need the manual to type in the password before the game will start.

Interestingly enough Maxis are bending over backwards to get you to send in the registration card that comes with SimEarth. Two years membership to their in-house club which gets you a newsletter and hot off the press information about other Maxis products. They also offer prizes for the people that send in genuine bug reports - if you report it first you get a prize.
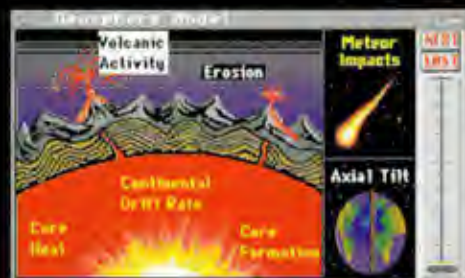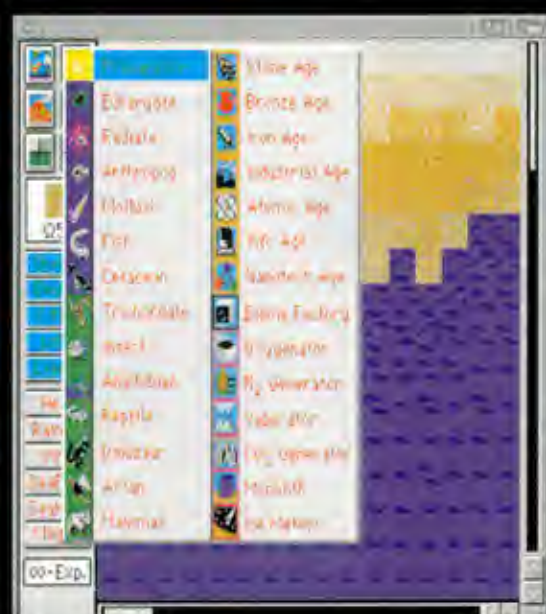
SimEarth is a complex and difficult game to play but if you like simulations then add this one to your collection.

But don't forget to send in your registration card!!!

Reviewed By:

Bill Holder

Supplied By:

Headlam Computers

RRP:

$99.95

Programming
ASSEMBLY *For Beginners*
Part 3

By: Chris Leathley

*B*ack for some more eh!. Well lets start at looking how the computer treats numbers and what are the binary and hexadecimal numbering systems.

BINARY

In the eyes of the computer, an electronic signal can only have one of two states. As we are going to work with the computer, we had better learn it's numbering system, called binary, in which a number is made up out of a string of '0' or '1' bits. (A bit is an acronym for BInary digiT).

A bit in a computer is a voltage level, 5 volts for a ON and 0 volts for a OFF. The Amiga uses 32 bits to hold numbers, this can be broken down into either 16 bits (a word) and 8 bits (a byte).

The computer assigns a certain number to these bits to help it make up numbers. The numbering follows.

BIT NUMBER
         7 6 5 4 3 2 1 0

ASSIGNED NUMBER
         128 64 32 16 8 4 2 1

A power of 2 table is used to translate a bit into a number. For example if bit 6 is set then you would power 2 with 6 which results in 64. A power of zero equals 1.

To hold the number 10 (in byte form) the computer sets the bits to ON (true) for bits 3 and 1 (8 + 2 = 10).

$10 = \%00001010.$

The largest number a byte can hold is 255, or 128+64+32+16+8+4+2+1. As you can see that is quite a small number. That's why computers use either 16 or 32 bits. A 16 bit number can go up to 65535 while 32 bits can hold a whopping 4294967295. Now this is where it gets very interesting. The computer depending on what size of data it is working on, assigns the highest bit (most significant bit) as the sign bit.

(ie positive or negative). It does this by flipping the state of all the bits and adding one. For example to convert positive one to negative one the process is as follows.

$$+1 = 00000001$$
$$= 11111110 \text{ (after flip)}$$
$$= 11111111 \text{ (added one)}$$
$$-1 = 11111111 \text{ (result)}$$

The more acute amongst you will notice that all bits set in a byte equals 255. The computer doesn't see any difference between 255 and -1 (neat!). The programming instructions you give it will either treat the data as signed or unsigned.

HEXADECIMAL

Ok, nobody can expect people to readily program in a stream of bits to the 68000 and the conversion between binary and decimal is by no means a trivial exercise. The assember can translate your decimal numbers into a binary number but to make it more understandable to the programmers, the guys in long white coats invented the Hexadecimal numbering system.

Decimal as we all know uses numbers to the power of 10. (0 - 9). The computer uses power of 2 to store numbers. The hexadecimal base uses one number (called a Nibble) to hold 4 bits. Most of the Amiga custom hardware registers require programming in binary, as each bit in a single register can have a totally different meaning to the one it's sitting next to. By translating every 4 bits into a single hex digit, things are simplified enormously.

The conversion table of Hexadecimal, Binary and Decimal. Note: The Assembler needs a prefix of S for Hex or % for Binary to stop it getting confused about which base you are using.

HEX DIGIT	BINARY DIGIT	DECIMAL COUNT
$0	%0000	0
$1	%0001	1
$2	%0010	2
$3	%0011	3
$4	%0100	4
$5	%0101	5
$6	%0110	6
$7	%0111	7
$8	%1000	8
$9	%1001	9
$A	%1010	10
$B	%1011	11
$C	%1100	12
$D	%1101	13
$E	%1110	14
$F	%1111	15

Now are we all confused?? I was when my dad explained it to me many many years ago. The only time you will really need to program in Hex is when talking to the Amiga's custom chips, and they will be explained very soon.

ARITHMETIC OPERATIONS

Ok enough of that, now down to the serious stuff. Last issue we looked at the MOVE instruction. Very good instruction but I don't think your favorite program uses that exclusively. Computers in general are number crunching machines, so they need a complement of commands to help them do just that.

This group of instructions perform the basic arithmetic operations; *addition*, *subtraction*, *multiplication*, *division* as well as *negation*.

Addition:
The ADD instruction allows you to add (what else) two numbers together. These can be specified by any of the addressing modes available to the 68000. The source is added to the destination.

```
ie.   ADD.W   #10,d0
      ADD.W   d0,d1
      ADD.W   d0,a0
      ADD.L   #12345678,d0
      ADD.B   #$EA,d7
      ADD.W   #10,SCORE
      (where SCORE is a do.w field)
```

Note:

All 68000 instructions only work with the size specified (8, 16 or 32 bits). None of other bits are altered. This is **VERY** important to remember especially when working with Address registers.

The 68000 really doesn't have an instruction called "**ADD**", it has the instructions, **ADDA, ADDI, ADDQ** and **ADDX**. These are used for the different addressing modes that can be used. You don't really have to know what they all do as the assembler picks the correct one for you.

Subtraction works in the same way but uses the OPCODE **SUB.<size>**

Multiplication:

The **MULU / MULS** opcodes multiply two 16 bit numbers together and stores the 32 bit result into the destination operand which **MUST** be a data register.

The difference between the **MULU** and **MULS** instruction is that the **MULU** treats both numbers as unsigned (positive only numbers) while **MULS** treats them as signed (positive or negative). In general **MULS** is only used in complex mathematics such as 3D or ray tracing.

EXAMPLE: **MULU   #10,d0**

Before the instruction was executed d0 contained 5. After the 68000 got its grubby little mitts on it, d0 now contains decimal 50 (10 * 5 = 50).

Division:

Like the multiply command the divide has two types of actions, **DIVU** (unsigned) and **DIVS** (signed). The divide commands work quite differently from the rest of the crowd (there is always one). The 32 bits of the destination DATA register is divided by the 16 bit source operand. The quotient (the number of times it divided into) is stored in the lower 16 bits while the remainder is stored in the upper 16 bits. The poor 68000 only works in whole numbers, so don't expect it to give you

a result with heaps of decimal places. If you divide 9 by 5 then the quotient would = 1 while the remainder would contain 4.

NEVER divide a number by zero as the 68000 will get very unhappy and will sit there sulking (soon followed by a Guru Meditation).

Negate:

The **NEG** instruction will change a number from being positive to a negative number. (it also works neg to pos). It first flips all the bits being used (size) and adds one.

```
      NEG.W   d0
```

If d0 first contained 20 ($0014 HEX) then after being negated d0 will hold -20 ($FFEC HEX)

The are a few more arithmetic operations but they will be explained as well as the above in more detail in the examples programs to come.

LOGICAL OPERATIONS

This group of instructions perform the four logical operations, **AND, OR, EOR** and **NOT**.

These four instructions are mainly used for graphic manipulation and work best in Hex or Binary. They all work on a individual bit process for the entire size specified. All logical commands have a truth table which they follow.

AND:

The **AND** instruction will logically AND two numbers together.

AND TRUTH TABLE

```
            0 AND 0 = 0
            0 AND 1 = 0
            1 AND 0 = 0
            1 AND 1 = 1
```

The above table states that a bit will only be kept if both the same bits are set in the source and destination operands.

%0101 AND %1101 = %0101

OR TRUTH TABLE

```
            0 OR 0 = 0
            0 OR 1 = 1
            1 OR 0 = 1
            1 OR 1 = 1
```

This will merge both the source and destination bit patterns together.

%0101 OR %1101 = %1101

EOR TRUTH TABLE

```
            0 EOR 0 = 0
            0 EOR 1 = 1
            1 EOR 0 = 1
            1 EOR 1 = 0
```

EOR or Exclusive **OR** will do the same as **OR** but where both bits are set, it will set it to a zero.

%0101 EOR %1101 = %1001

NOT will just invert the bit pattern in the source operand.

NOT %0101 = %1010

COMPARISON OPERATIONS

These instructions are used to set flags in the condition code register according to the result of the comparison.

CMP:

The **CMP.<size>** instruction will compare the source with the destination operand. Used to check maths and variables within the program.
ie. **CMP.W #0, LIVES** will compare LIVES with 0 and set the flags accordingly.

TST:

The **TST.<size)** command will test the source operand with zero and set the flags to show the result. Used quite a bit in games.

UNCONDITIONAL PROGRAM CONTROL INSTRUCTIONS

The **JSR** and **BSR** instructions are used to call a subroutine else where in the program. For example you may have a little routine to print a number on the screen. So instead of having that code copied lots of times in the program you can just call at any time saving lots of space.

The difference between **J(sr)** and **B(sr)** is that the **Jsr** uses a 32 bit address while **Bsr** uses only a 16 bit address. **Jsr** is only used in very big programs, or when it has to jump a very large distance (into the operating system).

The **Jsr** command can also use a lot of the addressing modes to get a jump address. Both commands will return back to the calling program when the RTS instruction is executed.

```
        bsr     PRINT
        .
        . rest of code
        .

PRINT:  (display number or
whatever)
        rts
```

The **JMP** or **BRA** instructions will jump to another part of the code and forget where it came from. Usually used for exiting programs.

CONDITIONAL PROGRAM CONTROL INSTRUCTIONS

According to what you want your program to do, you can set it to do specific actions when certain conditions are met.

The command to do that is **B** (branch) **cc** (condition). Like **BRA** but will only jump if the condition is true. If it failed then the next instruction will be executed

Here are some of the more popular condition codes;

BEQ branch if **EQUAL**

BNE branch if **NOT EQUAL**

BPL branch if **PLUS**

BMI branch if **MINUS**

BGE branch if **GREATER THAN OR EQUAL**
BLT branch if **LESS THAN**

BGT branch if **GREATER THAN**

BLE branch if **LESS THAN OR EQUAL**
BCC branch if **CARRY CLEAR**

BCS branch if **CARRY SET**

For example;

```
MAIN_LOOP:      TST.W   LIVES
        BEQ     GAME_OVER

        .
        . body of game code
        .
        SUB.W   #1,LIVES

        .
        BRA     MAIN_LOOP

GAME_OVER:  (do game over stuff)

        .
        . etc.

LIVES   dc.w    4    (lives equals 4)
```

The **GAME_OVER** routine will only be called if **LIVES** equals 0. It could also be written as **CMP.W #0,LIVES**. The MAIN_LOOP routine would be executed 4 times (until LIVES = 0)

Ok that's it for this issue. Next edition we will be going into the Amigas hardware. First starting at the Copper. (The custom chip that actually puts stuff on the screen).
I will be supplying several well commented, ready to run programs as examples, as well as implemting the majority of the above 68000 instructions in a more practical sense. By then I would have come back from the Paul McCartney concert I've been so looking forward to. (I'll most likely be slighly deaf as well)

Included on this issues Coverdisk is a program called the "**Instructor**". This is a 68000 instruction guide written by Tom Gubler. It explains what each instruction in the 68000 repertiore does and how it affects the flags. When first run, It will display the instructions on how to use it and the shareware messages. When you've finished reading this click on the close window gadget and a list of 68000 instructions will be displayed. Use the window slider to scroll the list up and down. When you want information on an instruction, click on the instruction name and all will be revealed.

Till next edition,

ZAPHOD

HOW TO?

/ Add an autoboot disable switch to an A2000 with a GVP series II controller. /

This article will describe a very easy modification you can do to your Amiga A2000 equipped with a GVP series II hard drive controller.

It will allow you to turn off your hard drive(s) and to boot up a game or demo with no fears about viruses creating

havoc on your hard drive, or the game or demo not running because you have a hard drive connected.

Parts Required;

1 spst micro mini switch.
1 metre of fine flexible insulated wire.
1 ic socket
(number of pins not important).

Firstly locate a suitable position on your A2000 for the switch, I placed mine on one of the blanking plates at the rear of my A2000.

Cut your length of wire into two 1/2 metre lengths. Strip the insulation away for about 2mm and solder these lengths to the switch.

If the switch has three terminals or has

six terminals, solder one wire to a centre terminal and the other to an end terminal next to it. Remove the five screws from the case of your A2000 and take off the lid.
If you are going to mount your switch on one of the blanking plates (highly recommended), remove this plate for drilling.

Drill a suitably sized hole to mount your switch in your chosen place, being very careful to miss all internal parts and watch for where the swarf (drilling waste) goes. Clean it all out very thoroughly later. You don't want your A2000 full of drilling's to short things out! So be very careful to remove all waste drillings from the insides of your Amiga.

Cut your IC socket into two halves lengthways with sidecutters and discard

one half we won't ned it for this project. From the other half cut off two joined pins, these will replace the BOOT jumper on our GVP controller card. Carefully solder the two wires joined to your switch onto the two pins of your IC socket piece.

Looking inside your A2000, locate your GVP controller. On the top component side edge you will see a jumper marked "BOOT".

Remove this jumper, and place it somewhere safe in case you wish to return your A2000 to standard again. Mount your switch and plug the 2 pin piece of IC socket connected to your switch onto the BOOT jumper's pins on the GVP card, exactly where the jumper used to be.

Testing Time!

With the switch in the ON position, everything should be as it was, your hard drive will boot as normal when you switch on.

With the switch in the OFF position, if you turn on your A2000, the workbench hand or version 2.04 disk animation will appear and you can now boot from DF0: or with v2.x any floppy and the hard drive will not be seen by the system.

I would not advise that you go flicking the switch with the power on though.

If you have troubles, check your work carefully, there is not much that can go wrong.

If your hard drive does not boot in either switch position, check your switch, it must short out the BOOT pins to allow the hard drive to boot.

If the switch has no effect, check that you have removed the correct jumper on the GVP controller, and that the switch open circuits the BOOT jumper.

Enjoy!

BCNU
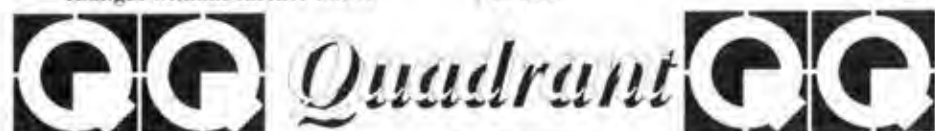
Raff...

OZAmiga *Mega*Boards

NSW

Amiga Connection BBS Club	02-970-6444
Amiga File Server	02-876-8965
AmiOz BBS	02-627-4442
Amitech Support BBS	02-544-1248
AMY BBS	02-607-4253
Blue Marlin BBS	043-85-1463
The Round Table	043-43-3036
Oz World BBS	02-891-1886

SA

Adelaide Amiga UG BBS	08-293-5399
Alternate Reality	08-43-5529
Blue Lake BBS	087-23-1354
MEGA FILES BBS	08-255-2052
Midnight Caller	08-281-2094
SA Country CLUB	08-284-7992
The Blue Max BBS	08-374-2702
The Falcon BBS	086-73-7523

Tas

Nightmare BBS	002-78-1363
PointLess BBS	003-91-2042
Portal BBS	002-49-8012
Tassie DataBank	003-44-9762
The Dragon's Weyr	002-63-5278
The Solar Connection	003-99-3492

NT

Amiga Retreat	089-45-1516
Deep Thought	089-53-1499
Kakadu Konnection	089-48-0700
Opus THETA	089-87-3171

ACT

Alchemy ACT	06-296-3110
Amiga Empire	06-292-6826
Amiga Frontier	06-253-1170
Desktop Utilities BBS	06-239-6659
Filco (Phillip College) BBS	06-282-2911
Maestro Modem Support BBS	06-299-2189

Qld

Amiga Mother Baud BBS	075-97-2381
Amiga Resource	07-265-3369
Black Cat BBS	07-394-4826
Commodore Users Group Qld	07-300-6357
Electric Dreams BBS	07-399-1322
Gold Coast BBS Systems	075-39-1732
Paradise BBS	075-97-1717
Sunshine BBS	074-45-1124

WA

1990 MultiLine	09-370-3333
AmigaLynk	09-528-1025
Coast To Coast BBS	09-490-1790
Cracker Box Palace	09-439-2332
Dark Closet BBS	09-493-3052
Dark Room BBS	09-332-6908
flame BBS	09-380-1095
Pilbara Image BBS	091-44-4098

Vic

Amiga Central	03-376-7375
AmigaLink	03-792-3918
Andy's BBS	03-357-3414
Bards Realm BBS	03-584-1693
Club Amiga	03-527-2835
Crazy Diamond BBS	03-569-8873
Guru Meditation BBS	03-326-0440
The Amiga Limits	03-725-2895

Just a few International numbers for those who don't care about the phone bill...

Amiga Alley	0015 1 206 859 0525
Excaliber	0015 1 214 341 2775
ComLink	0015 1 414 784 2096
Impact Zone	0015 1 703 237 2173
LEAF	0015 1 814 868 0382

Inside the *Amiga* a Beginners Guide

Recently, quite a few Amigans have asked for an article describing the workings of the Amiga and what all this guff about CHIP MEMORY and FAST MEMORY is all about. Not only that, who the hell are Denise, Agnus, Paula, and Gary anyway?

To understand the memory layout of the Amiga, it is first necessary to have a bit of a run down of the major chips inside.

Firstly there is the humble CPU or Central Processor Unit. In the case of Amiga 500/1000 or 2000's it is a Motorola 68000, whilst in the accelerated machines such as the A2500 or the A3000, they contain more advanced processors.

The A2500 for example contains the Motorola 68020 CPU, while the A3000 contains the 68030 CPU. There are also boards available from several manufacturers to add these advanced processors to the A500/1000/2000 series and boards to add 68040 processors to most Amigas also. These advanced processors are directly related to the humble, yet powerful 68000 as used in Amiga A500, A1000, and A2000 series machines.

Helping the CPU along are several CUSTOM chips, they are custom because they are unique to the Amiga computer and form the very heart of the machines' power. Without these custom chips the Amiga would be rather dull, as they provide among other things, the outstanding graphic and sound abilities of the Amiga.

These custom chips have nicknames and you have probably heard Amiga guru's chatting about them.

AGNUS for example has the following features and functions:

A *Bit Blitter*, which allows high speed animation, and doesn't need the CPU to help out. It also contains the Copper, or Co-processor for the display and the DMA (Direct Memory Access) channels to allow the disk drives and

sound to operate with minimal CPU intervention.
It is the chip which provides refresh and control for the display or CHIP RAM There are several versions of the Agnus chip.

The first version as used in the A1000, had two basic types, one for the North American and Japanese TV standard (NTSC) and one for European and Australian TV standards (PAL). It is able to address 1/2 meg (512K) of Chip RAM only.

The next version is similar but has a different case style and is used in early A500's. It also has NTSC and PAL versions and addresses 1/2 meg (512K) of Chip RAM.

Following these came the "Fat" Agnus. It can address 1 megabyte of chip RAM. Then on to the "Obese" agnus which can also address 1 megabyte of Chip RAM and has the ECS or Enhanced Chip Set functions as well.
Then also there is the 8375 or 8372b Agnus as used in the A3000 and A500 plus, it can address 2 megabytes of Chip RAM.

I'm told that there is a new chip called **ALICE** used in the A1200 and A4000 Amigas which has many new functions but has the same basic functions as the original Agnus chip.

Next we come to **DENISE**.

Denise has two basic revisions, the original A1000 style and the ECS Denise chip. Basically the same, the ECS version adds new display modes to your Amiga when used in conjunction with an ECS Agnus chip.

Denise has the following features and functions:

It provides the many different display modes that the Amiga is capable of. It also provides the 4096 colour palette of the Amiga. It controls the hardware Sprites and has a 60 and an 80 column text mode.

PAULA is next.

Paula has remained practically unchanged from the original A1000 all the way to the new A1200 and A4000.

Paula has the following features and functions:

Four voices of sound output configured as two stereo channels.
It can produce nine octaves as well as complex waveforms using both amplitude and frequency modulation. It contains the input and output circuitry for the disk drive data and mouse/joystick ports.

And now for **GARY**.

Gary is not in the A1000, the A1000 used many more chips than does the A500 or the A2000. Gary is the result of compressing some of these chip functions into a single custom control chip.

Gary has the following features and functions:

Gary provides all bus control signals and all address decoding, (Which explains why a lot of memory and accelerator boards for the A500 include a Gary chip adaptor).
Gary also provides the reset circuitry, and some of the floppy disk drive's control functions.

There are also a couple of other less well know custom chips in the Amiga. These are known as CIA or Complex Interface Adaptor chips. These chips provide among other tasks, the interface to the outside world for your Amiga, in that they provide the circuitry for the Serial and Parallel ports.

In the case of the A2000 there is also a BUSTER chip to handle some of the expansion slot circuitry found in the A2000. The A3000 contains several more custom chips including AMBER to handle the display De-Interlacing.

The Amber chip is also found on the

Commodore Display Enhancer (flicker fixer) board for the A2000.

The Chip in **CHIP RAM** is a reference to the 3 common display and sound custom chips, as it is the ram that these chips can talk to directly, although the CPU can also talk to it.
That means to you and I, that the more of this chip ram we have the more graphic and sound oriented tasks we can perform. With more chip ram, larger and more colourful brushes may be picked up in Deluxe Paint, for example. Longer sound samples can be made with AudioMaster.
In other words, more chip ram is the way to go.

FAST RAM, is memory that ONLY the CPU or processor chip to talk to, the custom chips cannot access this ram. It is called 'Fast Ram' because of the way

the Amiga makes use of it's ram.

I will attempt to explain in simple terms the way the Amiga uses it's memory, it is quite a complex subject so this will just be an overview for now.
Chip ram is accessed on every second clock cycle and Fast ram is accessed every clock cycle. This explains why an Amiga equipped with at least SOME Fast ram is quicker than one that has only Chip ram.
It amounts to a difference in speed of about 20%.

Memory that is fitted to the expansion slot in the trapdoor under an Amiga A500 is often referred to as SLOW/FAST ram the reason being, that although this ram is technically Fast ram, it is as slow as Chip ram because it is the Agnus chip which controls it, the same way Chip ram is.

The reason for this rather complex method of ram manipulation is basically due to the way the Amiga multitasks.

In a future article, I hope to be able to describe how to modify your A500 to have 1 meg of Chip ram, as just adding ram and having the right Agnus chip inside is not enough. You must change some of the internal wiring also.

I hope that this article helps remove some of the mystery from the Amiga's complex internals.

Until next time.

Raff...

How to make a

FLICKER REDUCER

A D.I.Y. Project for around $10.00.

Do you hate that wretched interlace flicker on your Amiga when you use it in Interlace Mode?
Can't afford a Flicker Fixer and VGA monitor?

Well how about a Flicker Reducer for around $10.00?
Interested?
Read On!

All you need to reduce that flicker is a piece of tinted perspex. If you have a 1081 or one of the earlier 1084 or 1084s series monitors, a piece about 320mm X 245mm in what's known around the local Gold Coast plastics' suppliers as a "Haines Hunter" tint, about 3mm thick 6mm at the most. Any medium grey smoked tint would do though.
(Apparently this perspex was used as the side windows of certain Haines Hunter boats manufactured here.) I can tell you from personal experience that this tint works quite well, but I'm told that if you can find someone who can supply either glass or perspex that is "Polarised," that this may work even better.

Once you have obtained your perspex or polarised glass all you need do is stick it to your monitor in front of the screen. I

have found that double sided tape works best here, as blue tack does not bond strongly enough. If you have a monitor with a rather curved screen, like one of the newer 1084 SP1 style monitors. (They have their power switches at the back, the older 1084/1081 series have their's at the front). You will need to curve your perspex to fit properly. I have found that this can be difficult to do at home, so it may be best if your local friendly perspex supplier could bend it for you.

For those of you who are feeling brave, I will describe how I did it with limited success.

Obtain a couple of lengths of wooden dowel approximately 25mm diameter and around 350mm long. We will use these to support our perspex in your Mum's/Wife's/Girlfriend's oven. Place the perspex in the oven, and place one piece of dowel under each of the shorter sides of your perspex.

The idea is to have your perspex sitting on top of the dowels, with nothing supporting the middle section of it, so that it can sag down a bit when soft. Turn the oven on and adjust the thermostat to about 200 degrees

Centigrade . Close the door and wait for the oven to warm up.

You must check your perspex regularly every couple of minutes, and when it is soft in the middle, remove it carefully with some oven gloves, or similar protection, and gently bend it to a gentle curve.
I pressed my knee into the middle of it and bent it around my knee using oven mitts and I was wearing jeans to protect my knee.

You may have to try this a couple of times to get the right curve without wrecking the perspex, I did.
Just bend it gently and don't force it. If it won't bend place it back in the oven for a while longer and try again. When you think the curvature is about right, carefully test the shape by placing it in front of your monitor to check the fit. If you persevere, you will get a nicely curved Flicker Reducer to fit your monitor.

I have seen other types of glare and flicker reducing screens around. These are like a very fine grid of material that you look through. Some of these make all sorts of claims about their abilities to reduce this and enhance that, but they didn't appear to work as well as my "Haines Hunter" tinted Perspex!
They cost more besides!
And you can tell your friends that YOU made it!

Anyway good luck, until next time.

Raff Lerro
TECHNICAL ADVISOR.

ELEVATORS

A game for kids from 3 to 103

Elevators is a childrens game written by our very own Neil McKnight.
This game is quite like snakes and ladders in style but has been made even more entertaining (and, at times, frustrating).

For one to four players, you begin play by choosing your board. There are many different boards to choose from which makes for a different game each time you play. To roll the die you simply jiggle the joystick from side to side, which, in turn makes the cup on screen shake.

The computer will automatically move your piece the required number of spaces and where you land is where the fun really starts. The elevators (hence the name of the game) will take you either up or down. Balloons will move you forward one space, rockets two spaces. Arrows can send you back either one or two spaces depending on which type you land on.

If you land on a square showing one or a pair of dice you will get one or two extra turns accordingly. The real nasties are the beds with the zzz's and jail.

Should you go to sleep (on the bed) you will miss one turn and if you go to jail you will miss two turns.

One of the big plusses in this game is that it really makes no difference what age you are or what amount of computer skill you have, as anyone can play AND WIN (this was ably demonstrated to me when I was beaten most convincingly by a three year old!).

Mainly aimed at the kids though, this game has found a niche in our household as a thoroughly entertaining kidsitter. Oh and the sound effects have to be heard to be believed. Excellent!

Elevators is part of a range of budget software designed for those people who want something playable which doesn't cost the earth. At an average price of $19.95 they won't break the bank.

If you want to know any more about the games written by Neil then just write to the address below and ask..

Guild Hall

*O*kay scum, drag out that old copy of Ultima Five that you gave up on, because I'm about to reveal the inner most secrets of this almighty game. This time we'll get you through it or you'll die trying. Now listen up good because I'm not into repeating myself. The old brain isn't what it used to be, so my hints will probably be out of order - but hell I'm not going to hold your hand while I do all the work...

Now there are some things you absolutely need to succeed in this game and they are the Amulet, Crown and Sceptre that belong to Lord British himself. The shards of falsehood, cowardice and hatred, a grapple, the sandalwood box, skull keys. Oh and you will have to destroy the Shadowlords.

Now young David in the lighthouse, called Greyhaven, has a sextant for offer and Lord Michael in Empath Abbey has a grapple.

That scum Judge Dryden in Yew knows all about the oppression and can point you in the right direction to get the black badge, the badge lets you walk around Lord Blackthorn's castle safely - well pretty safe anyway.
Speaking of Blackthorn's castle those thrice cursed gargoyles are damn near invincible so you might be best to use the flying carpet to outrun them.

cannot for the life of me remember who told me but there is a spell to turn your foes into rats. You have to mix silk, ash, mandrake and nightshade together to make the magic work. Now what were the words? Oh I remember REL XEN BET yeah that's it, that'll turn the little buggers into rats.

Now it is a hell of a lot easier to fight from far away than it is from close up and the best weapon for that is the magic axe, just throw it and it'll keep on coming back. The dungeons are full of false walls and hidden monsters so if you can, try to kill them with a halberd before springing the trap.

There are rumours going round about some glass weapons or such, well let me tell you now you can forget them. You don't need them. Oh I know where they are - there on the Serpent's Spine and that's where they should stay.

Look, you can only use them against Shadowlords otherwise they break and the last thing you want to do is wrestle with a Shadowlord.

Just forget about them. Use the Shards to kill the Shadowlords and you'll live to be old and even uglier than you already are.

Now if you have any more trouble you just let me know and I'll solve it for you - doesn't matter what game it is I will do my best to you an answer and help you back on track. Just send question and comments and even hints or solutions to the magazine and we'll see about getting you sorted out.
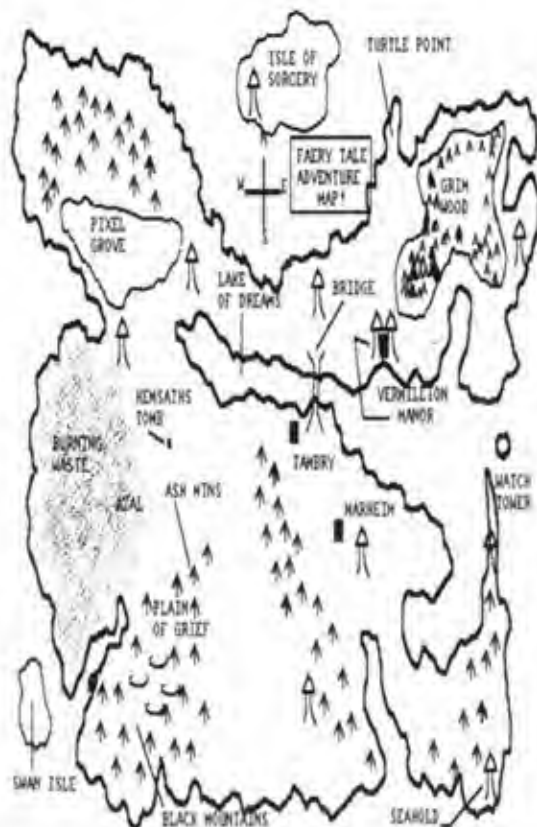
Send letters to:

The Guild Master
PO Box 567
Mirrabooka
WA 6061

I hope these maps from the Fairytale Adventure are of help to someone.

DRAGON
MAZE

HAGIC HANDS

Cheats for Ultima used with Action Replay

For all those people out there lucky enough to have an action replay and a copy of Ultima Five then this list of cheats is just for you, they don't solve the game for you but they make a hell of a lot easier to finish.
You still have to fight and gain experience but imagine how much easier it is with unlimited reagents and unlimited money.

ASH	: 00BBDA
GOLD	: 00BB35
NIGHTSHADE	: 00BBE0
GOLD MULTIPLIER	: 00BB34
MANDRAKE	: 00BBE1
FOOD	: 00BB33
BLOOD	: 00BBDE
MOSS	: 00BB37
GEMS	: 00BBDF
PEARL	: 00BB38
TORCHES	: OOBBDD
SILK	: 00BB36
KEYS	: OOBBDB
GINSENG	: 00BB3B
SKULLKEYS	: 00BBDC
GARLIC	: 00BB65
ARROWS	: 00BB5D
FLAME OIL	: 00BB67

Keep your numbers less than ninety nine or it just goes back to zero. With a little luck and some perseverance you should be able to finish the game no worries now.

If anyone out there has some cheats they found when using the cartridge then write in and let everyone know.

SKILLS REQUIREMENTS FOR COUNTDOWN TO DOOMSDAY

The following skills are extremely important: Zero-gravity maneuvering should be at least 40. Everyone, except for the medics, should have First Aid. At the higher levels, First Aid also gives a low-level Treat Light Wound capability. In this game, you have to be next to a character to Bandage him.

One character should have Bypass Security and Open Lock at the highest possible levels. (You do a lot of breaking and entering.)

Programming at a high level (20+) is recommended for one character. The rocketjock should have Pilot Rocket at the highest possible level and Navigation skill of at least 20.

Besides the engineer, at least one other character should have Juryrig skill of at least 20; having two characters with this skill is preferred.

The engineer should have all the repair skills. Repair Weapons can be spread around to the other characters. It is a good idea to have at least one other character who can make repairs.

The medic should strive for the highest possible level at Treat Critical Wounds first, then Treat Serious Wounds, and then Treat Light Wounds.

If some one else has a high First Aid, then Treat Light Wounds may be neglected to increase the other medical skills.

Diagnose and Treat Poisoning need only be at least 15.

Treat Stun enables a medic to unstun someone who has been stunned. To do this, move the medic next to the character and the Aid command should appear in the combat menu. Select Aid and the character will be unstunned if the medic has a high enough skill level (about 15+).

You should have the following skills spread among your party:

Leadership - at the highest level
Battle Tactics - at the highest level
Library Search - of at least 20
Notice - at the highest possible level
Climb - of at least 20
Demolition - of at least 15
Planetary Survival - of at least 20
Sensor Operations - of at least 20

The following skills are used in the game but are not absolutely needed: Move Silently (only a rogue needs this skill, and it is for Backstabbing), Pick Pocket, Use Jet Pack, Commo Operation, Disguise, Befriend Animal, Etiquette, Fast Talk, and Intimidate.

Send any cheats or hints to the Guild Master....
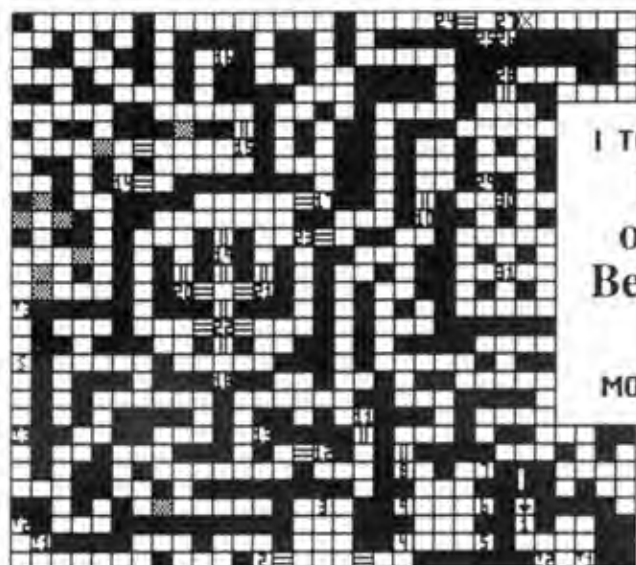
I TO LVL 3
Eye of the Beholder II

MOONTOWER LEVEL 4

Campaign

Campaign is a tactical and strategic war simulation that is billed as "The most comprehensive military simulation of warfare in World War II". This statement is the bare truth, I have never seen anything that can rival it for sheer complexity and historical accuracy (I checked it out as much as possible).

Field Marshal Erwin Rommel did not take part in the most famous desert battle - El Alamein, since he was in hospital in Germany. His acting commander had a fatal heart attack on the first day, and Rommel only arrived in time to organise a retreat.

You can take command of up to 3000 vehicles on over 20 historically accurate maps ranging in size from 625 to 10 million square kilometers. The many locations vary from the Sahara Desert to the Battle of the Bulge in the Ardennes and the decisive D-Day landings.

All terrain maps are highly detailed, including features like Towns, Villages, Rivers and Woodlands.

There are over 150 vehicle types which include Russian, German, American and British tanks as well as some of history's greatest aircraft like the Focke-Wulf, the Junkers and the Messerschmitt. If that's not enough for you, there are also a number of naval vessels including Battleships, Destroyers and Submarines.

Control either Allied or Axis forces from the level of Field Marshal or right down to the level of a tank driver.

-As a Field Marshal you can co-ordinate the strategy for all groups including Tanks, Aircraft, Supply Convoys, Ships and Production Centres.
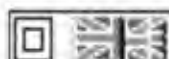
-As a General you can control the fighting of an individual battle with as many as 16 active Tanks, plus Artillery and Air support.

-As a tank driver/ gunner you can experience the thrill of battle first hand.

You can lay an artillery barrage at a particularly vital rail crossing, or send a squadron of bombers to decimate an enemy stronghold. You will need to create a full supply system incorporating factories, convoys and ammunition to back up your besieged forces.

It is also vital to arrange intelligence and reconnaissance missions so that you know which targets need the most immediate attention.

Hauker Typhoon

Ground Attack aircraft	
Top Speed (km/h)	640
Total Machine Guns	4
Number of rockets	8
Range (km)	1000
Total bomb capacity (kg)	900

In July 1944, Adolf Hitler was almost assasinated. The "July Bomb Plot" made Hitler suspect everybody, and Rommel was forced to commit suicide by the Gestapo.

Relive the exultation of seeing your forces capture an enemy position or the utter hopelessness as your troops are over run by superior and overwhelming odds.

A game of truly awesome scope that will appeal to the strategist in all of us.

Reviewed by:
David Reeves
Review copy supplied by:
Headlam Computers
RRP:
$89.95

General Heinz Guderian largely invented Blitzkreig (lightning war) during the 1930's, and even published a book describing exactly how it worked. The method still came as a complete shock to the Allies in 1940.

Also included is a map editor which allow you to edit existing maps or create new ones of your own.

The editor option is available at any time, allowing you to pause and enter the editor to modify terrain.
You can even swap sides.

M4 Sherman

|	
Front Armour (mm)	64
Side Armour (mm)	38
Rear Armour (mm)	38
Maximum Armour Penetration (mm)	90
Maximum Road Speed (km/h)	43
Maximum X-Country Speed (km/h)	27

In this epic adventure you take on the role of Indiana Jones, famed archaeologist/adventurer, as he attempts to discover the long fabled city of Atlantis.

The year is 1939, it is the eve of World War II.

Nazi agents, eager to unleash the wonderous powers said to be hidden

Search the Bowels of the University
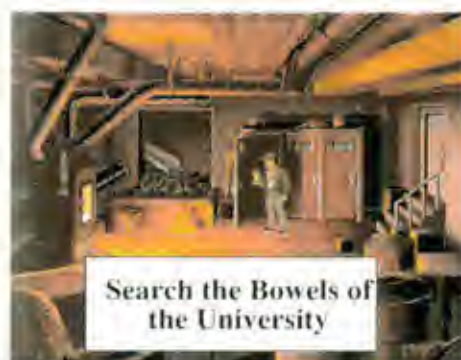
within the sunken city, are hot on Indi's heels....

Or have they already passed him ?

The game is played in the classic Cinemagraphic style common to most Lucas Arts games.

The first thing to strike you when you open the box is the ELEVEN disks

Things can be Decieving

which take up most of the box. When installed on your hard disk this game takes up a massive 9 MB.

The games first challenge is for the player to enter a theater, this may be accomplished in three ways as can most

See your flight path on a map

of the puzzles in the game.
Each entrance is of comparative difficulty. THE MAZE - make your way through a random pile of boxes to find a ladder, FIGHT - beat up the bouncer at the backstage door (he is pretty big) or TALK - flatter the bouncer or say almost anything that will get you through the door.
The multiple ways of achieving a particular goal make the game much more open to replayability.

You will encounter many different modes of transportation as you progress towards Atlantis including a camel, a balloon, a car and even a submarine.

Each has different controls and can only be used to achieve specific goals. Fate of Atlantis plays well under Workbench 2 but is a bit slow, no matter if you are using floppy disks or a hard drive.

Apart from this it is full of baffling quizzes and mind boggling puzzles, a must for those that like to sit up at night and give themselves a brain strain (me for one).

Find strange artifacts from Atlantis

Reviewed By:
David Reeves

RRP:
$79.95

Visit Exotic Locations

Dear Denise,

Dear Denise,

While searching for a cheap accelerator for my Amiga 500, I heard that a few drops of the popular soft-drink C_ C___ allowed to evaporate on the left CIA chip, produced a significant increase in speed.

Is this dinkum ?

Ted Wally
(SA)

Sorry, but this classic little "Hack" no longer works since Gallium Arsenide was banned as a food additive. However, a little utility called "TEMPUS" currently doing the rounds shows promise. The included "Doc." file requires you to dispose of all clocks and radios in the house and to put Tempus in your startup-sequence. You then get a display of your inbuilt clock in which the Hour Digit only advances every two hours, resulting in an apparent speed increase of approximately 54% ! The side effect of increased ageing seems a small price to pay for this terrific example of lateral thinking.

Yours Incrementally,

Denise

Dear Denise,

I have just bought a second-hand printer for my Amiga 500, but can't seem to get it to work. Does it have to be "MOUNTED" ?

Donald (Donger) Wozak
(N.Z.)

Dear Donger,

It is not necessary to mount your printer !
For now, why don't you just hold hands and read the manual together.

Slightly Shocked,

Denise

Dear Denise,

I am not being long in this wonderful country and wishing to become familiar with computers and other appliance electricals. Very pleasant couple next door, Mr. and Mrs Pratt, are telling me to be must buying Compatible IBM, but nephew Singh is saying Amiga to be exelent computer.

Please to advise,

Rashid Prandrathan
(Vic)

Dear Rash,

The couple of Pratts next door don't know computer from capsicum. Would urge to consider advice of Singed Nephew.

Yours Ethnically

Denise

Dear Denise,

I am keen to computerise my rapidly expanding and lucrative Psychiatric practice and after a little reading, have become rather intrigued by the Amiga range of computers.
However, do you think that suitable business software exists to control the finances of my office.

Cost is no object.

Dr. Sigmunde Thruste
(Freudian Analist)

Dear Doctor Thruste,

Your letter aroused me, er, my interest enormously. Compared with a few years ago, there is now a large breast, er, breadth of sophisticated business software for you to blouse, er, browse through.

Available Anytime.

Denise

Dear Denise,

I'm realy glad I bought my Amiga. In fact I'm so very happy now I rarely go out. The computer means so much to me, I just can't explain it. Do you think that being over friendly with a computer is dangerous? I've heard about radiation hazards, but I can't actually catch anything can I? Like a disease? Do you have any information about safe Hex?

Yours,
Worried.
WA

Dear Worried,

No you can't catch anything. I can suggest a good hardware store that will supply you with a long enough extension lead so you can at least take "Amy" out once in a while.

Here is to a long and happy relationship.

Denise

Dear Denise is brought to us each edition by the humorous talents of Ian Harris (Perth WA).

This article takes a look at what you can expect to see in the OZAmiga magazine in future editions.

Also we would like to include a few of the things you (the readers) have told us that you would like to see.

Like most things in this publication, certain features require your input if they are to succeed. So if you see something mentioned later in this article that you like the sound of or something to which you can contribute information too, then please write in and give your valuable assistance to our efforts.

If you have any ideas, or specific articles you would like to see that are not mentioned here, then write and let us know about those as well.

OK lets get on with what we are intending to do in the future.

C Programming - This subject is much in demand from many readers and I hope to get under way with a tutorial and regular column in edition six.

Hardware Hacks - We tried a few of these in early editions of the magazine and received quite a good response. As a result we have decided to continue these for as long as possible, the first of which is in this edition.

Technical Tips and Solutions - This section is designed for the more advanced users and is primarily a question and answer column devoted to those that like to do hardware modifications to their machine in the hope of improving its performance.

Beginners Aid - This column is the result of a direct request and will deal with some of the subjects that seasoned users take for

OZAmiga in the Futre

Amiga Marketplace - We tried this in earlier editions but had very little response from our readers. The marketplace is, essentially, a   classified adds section where we will publish advertisments for goods that you wish to buy, sell or swap (Hardware will be given preference if space is short). This section is strictly for private adds only, no commercial placements at all.

User Group Information - For those who have read earlier editions you would have seen this as a regular section but I need Groups to send in some information about their activities for it to continue. As this has not been happening, I have been unable to include such information in this edition.

Amigas At Work - I intend to initiate this section to take a look at the types of businesses that use the Amiga and the uses to which it is put. This may very well help some people to find alternative uses for a very powerful machine.

granted. In the first insallment (in edition 6) we will look at ASSIGNS, what they are, how to use them and what they do.

Amiga Books - In this section we will look at the different books available on varying aspects of the Amiga. We will find out the best places to get such books in each state and what you can expect to pay for them.

Well that is what I have in mind for the future, if, as I mentioned earlier, you wish to add something to this then please write to:

Portfolio

of an

Artist.